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THE GENUS PUCCINELLIA IN EASTERN NORTH AMERICA.

M. L. Fernald and C. A. Weatherby.

(Plates 114–117.)

The essentially halophytic genus *Puccinellia* of Parlatore[1] has always been one of the least understood and, even to agrostologists, one of the most perplexing groups of grasses. The species superficially so closely simulate one another that by many experienced botanists they are merged; while the generic status of the plants is often questioned. Thus by some European botanists (for instance, Druce and Ostenfeld) the plants are included under *Glyceria*, by others (as Ascherson & Graebner) treated as a section of *Festuca*, while Britten & Rendle include them in *Sclerochloa*. In some characters species of *Puccinellia* certainly approach all three of these genera, yet as a whole the plants seem to constitute a good genus for which *Puccinellia* is the earliest unequivocal name.

In Europe, however, the name *Puccinellia* is not generally in use; but those who treat the group as a genus (for instance, Briquet, Richter or Rouy) call it *Atropis*. The status of *Atropis* as a generic name is, nevertheless, open to serious doubt. It is commonly cited as dating from Trinius in Ruprecht's *Flores Samojedorum Cisuralensium*,[2] and Grisebach in Ledebour's *Flora Rossica*, but in the enumera-

[1] Parl. Fl. Ital. i. 366 (1848).

[2] Rupr. Beitr. zur Pflanzenk. des Russischen Reiches, ii. 61, 64 (1845).

tion of plants Ruprecht included it, as Trinius [1] had previously done, under *Poa*, indicating *Atropis* [2] as well as *Phippsia*, *Catabrosa*, *Arctophila* and *Dupontia* as sections or subgenera, thus:

"311. Poa (Phippsia) algida (R. Br.)."
"312. Poa (Catabrosa) airoides Koel."
"313. Poa (Atropis) distans L."
"314. Poa arctica R. Br."
"315. Poa alpina L."
"316. Poa pratensis L."
"317. Poa (Arctophila) deflexa*."
"325. Poa (Dupontia!) psilosantha*."

On a succeeding page, in a note under *Poa* (*Dupontia*) *pelligera*, Ruprecht made the observation that these various sections differed from one another in certain characters: "Atropis Trin. (P. distans) Catabrosae quoad glumas proxima, spiculas habet (saltem in statu virgineo) lineares, fere teretes;" [3] and "From the condition of the glumes perhaps a series of genera as follows: Dupontia, Arctophila, Poa, Atropis, Catabrosa, Phippsia, Coleanthus." The enumeration of these plants as species of *Poa*, *Poa* (*Atropis*) *distans*, etc. by Ruprecht (or Trinius through Ruprecht) and then the giving on a subsequent page of brief, inadequate characterizations with the suggestion that these sections of *Poa* are "perhaps" genera, does not, it seems to us, clearly establish *Atropis* and others so treated as well published genera dating from 1845. And it is noteworthy that most authors who take up *Atropis* cite not only the Ruprecht reference but the later reference to Grisebach in Ledebour (1853)[4] as validating the genus. Grisebach, in Ledebour, certainly gave a clear generic characterization and treated the species unequivocally as species of *Atropis*, so that *Atropis* as a well published genus should date from Grisebach's treatment in 1853. In 1848, however, Parlatore, with equal clarity and completeness had characterized *Puccinellia* as a genus to include some of the species, *P. distans* and *P. maritima*, later placed by Grisebach under *Atropis:* and it seems to us that the cause of sound nomenclature is best served by maintaining the fully and definitely published *Puccinellia* Parlatore (1848) rather than the inadequately and uncertainly published *Atropis* Trinius in Ruprecht (1845, validated by Grisebach in 1853).

[1] Trin. Gram. Suppl. 68 (1836).
[2] Rupr. l. c. 61 (1845).
[3] Rupr. l. c. 64 (1845).
[4] Griseb. in Ledeb. Fl. Ross. iv. 388 (1853)

In attempting to determine the large collections of *Puccinellia* which have accumulated at the Gray Herbarium, especially from the shores of the Gulf of St. Lawrence, the writers have found it impossible to place many of the plants with the species commonly recognized as occurring in eastern America. It has consequently been necessary, in order to make the identifications of these plants as certain as possible, to study with some thoroughness all the species to which they are nearly related or with which they may be conspecific. This study has been greatly facilitated by the loan, through Dr. J. M. Macoun, of the large northern collections of the Geological Survey of Canada, by Dr. M. O. Malte of his private collections, and, through Mr. Bayard Long, of the representation in the herbarium of the Academy of Natural Sciences of Philadelphia; and we here express our appreciation of the opportunity to examine this most important material which, with the collections of the Gray Herbarium and of the New England Botanical Club, has been the chief basis of our work.

It quickly became apparent that much of the difficulty heretofore experienced in efforts to differentiate the species of *Puccinellia* has arisen through attempts to divide the plants too generally upon the habit of the inflorescence. Many species which in full maturity have the branches of the panicle widely divergent, in the young condition have close inflorescences with ascending or even appressed branches; so that attempts to use this character often lead to confusion. In searching for more fundamental characters which should be constant in all the material of seemingly identical plants many fruitless experiments were made; but finally the results resolved themselves into a series of differential points which seem to be reasonably definite and to divide the complex of material upon natural and geographically consistent lines. These characters have been tested through a prolonged study, which has occupied portions of three years, and although here indicated chiefly for the species which occur in eastern North America (south of Hudson Straits) they will prove important, we are sure, in the differentiation of the species of northwestern North America, Eurasia and the Arctic, in each of which areas there are several species not here discussed.

In the region specially covered by this paper (the area south of Hudson Straits) there are eleven well defined species of *Puccinellia*, each, as already implied, occupying a consistent geographic area. In two species, *P. maritima* and *P. phryganodes*, the anther is 1.5–

2 mm. long, about twice as long as in our other species. The first of these, *P. maritima*, is a plant of the Atlantic coasts of Europe and of eastern America (from Cape Breton to Pennsylvania); the second an Arctic species which extends southward to Labrador and the shores of Hudson Bay.

The remaining species have conspicuously smaller anthers, 0.5–1 mm. long, in only one species very slightly exceeding this measurement. In some of the plants with small anthers the mature caryopsis (and in good specimens of *Puccinellia* some inflorescences are usually mature while others are just expanding) is large, ordinarily more than 2 mm. long, while in others the grains are about 1.5 mm. in length. The measurements of the mature grain, like the measurements of the anthers, prove to be essentially constant in all material which is otherwise consistent and we have consequently used this character as an important one. Another character of as great importance is found in the margin of the lemma; in some species the lemma is entire or with at most one or two coarse teeth, while in others it is as definitely erose-ciliolate or serrulate. Good characters are also found in the palea, especially in the degree of ciliation; and other characters, often less readily described and more subject to variation, in the aspect of the panicle, the smoothness or hispidity of the rhachis and panicle-branches, the length of the glumes, etc.

The present paper, presenting our conclusions regarding the species of *Puccinellia* in northeastern North America obviously does not cover all the species which may possibly be found in the area. This will be apparent from the fact that one Arctic species alone, *P. phryganodes*, has yet been found on the little-explored Labrador Peninsula, but that in Greenland and Arctic America several other distinct species are found, *P. angustata* (R. Br.) Rand & Redfield, *P. arctica* (Hook),[1] *P. Vahliana* (Liebm.) Scribn. & Merrill, etc., any of which may be expected to reach the Labrador Peninsula or Newfoundland. Furthermore, such very limited collecting as has been done at remote points about the Gulf of St. Lawrence and the eastern coast of Newfoundland has brought together five very distinct plants which are unknown elsewhere in the East, and future exploration of the complex flora of these areas will doubtless extend the ranges of these plants and possibly bring to light other localized species.

[1] PUCCINELLIA **arctica** (Hook.), n. comb. *Glyceria arctica* Hook. Fl. Bor.-Am. ii. 248, t. 229 (1840).

In the following synopsis of the species of *Puccinellia* of eastern North America only those species which we know from south of Hudson Straits are included, but in the citation of specimens stations in western North America are often indicated, especially in the cases of newly described or newly interpreted species and varieties. The plates which have been most kindly prepared for us by Mr. R. E. Torrey illustrate details of all the species here included and some which have heretofore been ascribed to the region.

Key to the Species and Varieties of Puccinellia in eastern North America.

A. Anther 1.5–2.2 mm. long.
  Flowering culms tall, 2–8 dm. high: branches of the panicle scabrous: lemmas 4–5 mm. long, pubescent on the nerves below
    1. *P. maritima*.
  Flowering culms low, 0.4–1 dm. high: branches of the panicle smooth: lemmas 2.8–3 mm. long, glabrous. . . . . 2. *P. phryganodes*.

A. Anther 0.5–1 mm. long (1–1.2 mm. in *P. lucida*). B.
  B. Grain 1.4–1.7 mm. long. C.
    C. Lower branches of the comparatively short panicle (0.2–1.6 dm. long) densely flowered nearly to the base or at least below the middle: lemmas thick and coriaceous, without a broad hyaline tip; the midnerve reaching the apex, often excurrent as a very short mucro.
      3. *P. fasciculata*.
    C. Lower branches of the panicle floriferous chiefly above the middle, or, if much below, loosely flowered and the panicle much elongated (2–3 dm. long): lemmas thin and membranaceous in texture (firm in *P. laurentiana* and sometimes in *P. paupercula*), or at least with a broad hyaline tip; the midnerve not excurrent. D.
      D. Lemmas erose-ciliolate or serrulate under a lens. E.
        E. Glumes and lemmas truncate, erose-ciliolate under a lens.
          Mature panicle broadly ovoid, loose, its branches spreading or reflexed.
            Leaves of the culm 2–6 mm. wide, flat: panicle 0.8–2 dm. long: lemmas 2–2.5 mm. long. . . . . 5. *P. distans*.
            Leaves of the culm 2 mm. wide or less, becoming more or less involute: panicle 4–9 cm. long: lemmas 1.5–2 mm. long. . . . . (5.) *P. distans*, var. *tenuis*.
          Mature panicle slender-cylindric to ellipsoid, dense, its branches erect or ascending. . . . . 6. *P. coarctata*.
        E. Glumes and lemmas tapering to an acute or obtusish tip, not truncate, erose-serrulate: panicle-branches erect or ascending, rarely spreading.

Panicle-branches smooth or nearly so: lemmas 2.3–2.8 mm. long, firm in texture. . . . . 7. *P. laurentiana.*
Panicle-branches strongly scabrous: lemmas thin in texture.
Lemmas 2.5–3 mm. long: grain 1.4–1.6 mm. long. 8. *P. macra.*
Lemmas 2 mm. long or less: grain 1–1.2 mm. long. 9. *P. airoides.*

D. Lemmas essentially entire. . . . . 11. *P. paupercula.*

B. Grain 1.8–2.5 mm. long. F.

F. Flowering culms stout: leaves 2.5–6 mm. wide: lower panicle-branches densely floriferous nearly to the base: midrib of the coriaceous lemma prolonged to the apex, often excurrent as a short mucro. . . . . 4. *P. rupestris.*

F. Flowering culms slender: leaves 0.5–2 mm. wide: lower panicle-branches floriferous chiefly above the middle: lemma with hyaline margin; its midrib not excurrent. G.

G. Glumes and lemmas serrulate and erose-ciliolate under a lens.
Gray-green: panicle-branches ascending or spreading, not reflexed, smooth or nearly so: lemmas firm, 2.3–2.8 mm. long. . . . . 7. *P. laurentiana.*
Bright-green: panicle-branches at length reflexed, scabrous: lemmas thin and lustrous, 3–4 mm. long. 10. *P. lucida.*

G. Lemmas essentially entire, not ciliolate.
Lemmas 2–4 mm. long, tapering to a blunt point or obtusish: second glume 2–3 mm. long: panicle 0.2–1.8 dm. long.
Lemmas 2–2.5 mm. long: panicle 1–6 cm. long. 11. *P. paupercula.*
Lemmas 3–4 mm. long: panicle 0.3–1.8 dm. long. (11.) *P. paupercula*, var. *alaskana.*
Lemmas 4.5–6 mm. long, acute or acuminate: second glume 7–9 mm. long: panicle 1–2.5 dm. long. (11.) *P. paupercula*, var. *longiglumis.*

* *Anther* 1.5–2.2 *mm. long: perennials, often stoloniferous late in the season* (*usually after anthesis*).

1. P. MARITIMA (Huds.) Parl. FIGS. 1–6. Coarse; the smooth culms 2–8 dm. high, forming dense clumps: leaves pale, firm, usually involute in age, 0.25–1.7 dm. long; ligule 1–3 mm. long, entire, blunt-pointed: panicle 0.45–2.7 dm. long, usually somewhat exserted; the ascending or finally spreading, but not reflexed, branches and the pedicels scabrous: spikelets 0.5–1.2 cm. long, 4–11-flowered: 1st glume 2.2–3.4 mm. long, 3-nerved, acute; 2d glume ovate, 3–4.5 mm. long, 3-nerved, tapering abruptly to a short apex: lemma 4–5 mm.

long, thick, somewhat coriaceous, 5-nerved, minutely serrulate, obtuse or tapering abruptly to a blunt apex; midnerve prolonged to the apex and with the lateral nerves pubescent below: palea 3.2–3.7 mm. long, lanceolate, tapering to a bidentate tip, ciliate on the nerves; the cilia longest below: anther 1.5–2.2 mm. long: grain 2–2.2 mm. long: repent stolons coarse, rigid, often prolonged to 3–6 dm., developed chiefly from late summer to spring.— Fl. Ital. i. 370 (1848); Watson & Coulter in Gray, Man. ed. 6, 668 (1890); Britton & Brown, Ill. Fl. i. 214 (1896). *Poa maritima* Huds. Fl. Ang. 35 (1762); Eaton, Man. Bot. North. States, ed. 2, 366 (1818); Bigelow, Fl. Bost. ed. 2, 34 (1824); Torrey, Fl. North. U. S. i. 108 (1824); Beck, Bot. U. S., 409 (1833); Wood, Class-book, 447 (1845). *Glyceria maritima* Wahlenb. Fl. Gothob. 17 (1820), *fide* Aschers. & Graebn. Syn. Mitteleur. Fl. ii. Abt. 1, 460; Mert. & Koch in Röhling, Deutschl. Fl. i. 588 (1823); Gray, Man. ed. 2, 560 (1856); Wood, Class-book, ed. of 1877, 799 (1877). *Sclerochloa arenaria*, var. *maritima* Gray, Man. 594 (1848). *Diachroa maritima* Nutt. ex Steud. Nom. ed. 2, i. 497 (1840). *Atropis maritima* Griseb. in Ledeb. Fl. Ross. iv. 389 (1853). *Panicularia maritima* Scribn. Mem. Torr. Bot. Cl. v. 54 (1894).— Coast of Europe; salt marshes and saline or brackish shores, Nova Scotia; and southern Maine to Pennsylvania. NOVA SCOTIA: Louisburg, Cape Breton Island, August 18, 1898, *J. Macoun*, herb. Geol. Surv. Can. no. 21,056; saline marshes, Annapolis, June 26 and 27, 1883, *J. Macoun*, herb. Geol. Surv. Can. no. 29,582. MAINE: salt marsh, Cumberland Foreside, July 6, 1906, *E. B. Chamberlain*, no. 825; brackish shore, Great Chebeague Island, Casco Bay, July 2, 1909, *Fernald*, no. 1,346; salt marsh, Pine Point, Scarboro, June 30, 1909, *Fernald*, nos. 1,344, 1,345; Ocean Park, Old Orchard, July 1, 1901, *Kate Furbish;* salt marsh, Wells Beach, July 14, 1894, *J. C. Parlin*, 1898, *Kate Furbish;* sandy shore, Kittery, July 13, 1891, *Fernald*, July 3, 1903, *W. P. Rich.* NEW HAMPSHIRE: Rye, June 14, 1903, *E. F. Williams, B. L. Robinson*, no. 683: marsh at Hampton Beach, June 23, 1896, *A. A. Eaton.* MASSACHUSETTS: coast of Essex County, *Oakes;* in sand, Plum Island, Newbury, July, 1890, *Raynal Dodge*, June 25, 1912, *A. S. Pease*, no. 13,672; salt marsh back of dunes, Ipswich, July 13, 1913, *F. T. Hubbard*, no. 642; salt marsh, West Manchester, June 20, 1913, *F. T. Hubbard*, no. 577; Beverly, June 15, 1846, *J. A. Lowell* in herb. Bost. Soc. Nat. Hist.; Medford, June 23, 1879, *C. E. Perkins;* Somerville, June 11, 1879, *C. E. Perkins*, July 12, 1887, *F. S. Collins;* salt marshes along the Charles River, Cambridge, *Nuttall et al.;* salt marshes and sandy embankments, Revere, *H. A. Young et al.;* salt marsh and mill pond, Charlestown, June 5, 1889 and June 19, 1883, *C. E. Perkins;* Boston, *Faxon et al.;* Soldier's Field, Brighton, June 11, 1902, *A. S. Pease*, no. 1,712; Dorchester, June 5, 1865, *G. G. Kennedy*, June 12, 1887, *J. R. Churchill;* salt marsh, North Scituate, July 3, 1899, *G. G. Kennedy;* near high-tide mark, Arey's Pond, Orleans, August 10, 1913, *J. Murdoch, jr.*, no.

5,235; Barnstable, *C. S. Williamson* in herb. Phil. Acad. RHODE ISLAND: Newport, *J. W. Robbins* in herb. Bost. Soc. Nat. Hist. NEW JERSEY and DELAWARE: very doubtful. In herb. Phil. Acad. there is a mixed sheet containing three labels and collections: (1) an Alaskan species, (2) *P. maritima* from Cambridge, Massachusetts, and (3) several culms of *P. maritima* and a label marked, not in Nuttall's hand, "'P. [oa] maritima? sea-coast N. Jersey & Delaware' (Nutt.)"; but the species does not now seem to be known from south of Rhode Island. PENNSYLVANIA: ballast ground with *P. distans*, Navy Yard, Philadelphia, June 1, 1865, *C. E. Smith* in herb. Phil. Acad.; ballast, Philadelphia, July, 1870, *I. C. Martindale* in herb. Phil. Acad.

The name *Puccinellia maritima* has been applied to various plants in North America, but in its essential characters the coarse species, which abounds on the marshes from southern Maine to Rhode Island (and locally in Nova Scotia and formerly as a ballast plant at Philadelphia), is the only American plant which closely matches the typical British material of *P. maritima*. Our plant is often taller and has larger panicles than the British material, in these characters approaching the large continental extreme which has been called *Atropis Foucaudi* Hackel. The American plant, however, varies so greatly in stature and in size of panicle and of spikelet that we have been unable satisfactorily to divide the material. The species appears to be undoubtedly indigenous on the coasts of Nova Scotia and New England, although sometimes also introduced on ballast; but south of New England it is apparently only a casual plant of ballast lands.

2. P. PHRYGANODES (Trin.) Scribn. & Merr. FIGS. 7–11. Low and slender, forming close mats; the decumbent culms 0.4–1 dm. high: leaves slender, 2–4 cm. long, flat or becoming involute, 0.5–1 mm. wide; ligule 0.5 mm. or less long, truncate: panicle 2–3.5 cm. long, barely exserted, with few smooth short erect branches and pedicels: spikelets 4–6 mm. long, 3–4-flowered: 1st glume 1.3–2 mm. long; the 2d 2.5–3.5 mm. long, obtuse or acutish, entire: lemma 2.8–3 mm. long, firm in texture, 5-nerved, broadly obtuse, entire, or lacerate above, glabrous: palea barely shorter, subtruncate or emarginate, smooth or slightly ciliate-scabrous; the nerves somewhat excurrent: anthers 1.5 mm. long: repent flagelliform bulblet-bearing stolons 1–3.5 dm. long, freely developed especially on sterile plants.— Contrib. U. S. Nat. Herb. xiii. 78 (1910). *Poa phryganodes* Trin. Mém. Acad. St. Pétersb. sér. VI. Math. Phys. Nat. i. 389 (1830 or 1831). *Catabrosa vilfoidea* Anders. in Malmgr. Öfv. Vet. Akad. Förh. xix. 254 (1862). *Molinia distans*, var. *reptans* Hartm. Excursions-fl. 17 (1846). *Glyceria vilfoidea* Fries, Öfv. Vet. Akad. Förh. xxvi. 139

(1869). *G. reptans* Krok, Bot. Not. 140 (1899). *G. maritima*, var. *reptans* Simmons, Vasc. Pl. Ellesmereland, 159 (1906). *Atropis vilfoidea* Rowlee & Wiegand, Bot. Gaz. xxiv. 422 (1897).— Arctic regions, south to Labrador, Keewatin, and the Bering Sea region. LABRADOR: Nain, August 11, 1897, *J. D. Sornborger*, no. 237. KEEWATIN: Cape Henrietta Maria, Hudson Bay, August 18, 1904, *W. Spreadborough*, herb. Geol. Surv. Can. no. 62,742. ALASKA: abundant on saline mud flats, but no flowering plants found, St. Paul Island, July 31, 1897, *J. M. Macoun*, herb. Geol. Surv. Can. no. 16,223; originally described from Kotzebue Sound, and recently collected (acc. to Scribner & Merrill, Contrib. U. S. Nat. Herb. xiii. 78) on the Seward Peninsula.

The numerous flagelliform stolons are very characteristic of this northern species, but they should not be taken as an absolute diagnostic character since *P. paupercula* and its var. *alaskana* occasionally have stolons which in all characters appear inseparable from those of *P. phryganodes*. The identification of these plants by the stolons alone is not final and the difficulty of accurate determination is rendered greater since the stoloniferous colonies are so frequently destitute of inflorescences.

* * *Anther* 0.5–1 (*rarely* 1.2) *mm. long.*

+ *Lemma thick and coriaceous; its mid-nerve often excurrent: lower branches of the panicle densely-flowered to below the middle: annuals or biennials.*

3. P. FASCICULATA (Torr.) Bicknell. FIGS. 12–16. Rather coarse; the smooth mostly geniculate culms 1.5–8 dm. high: leaves 2–6 mm. broad, flat, or finally involute: panicle long-exserted, ellipsoid to ovoid, 0.2–1.6 dm. long, contracted; the ascending or slightly spreading sparingly scabrous branches floriferous nearly to the base: spikelets 3–4 mm. long, 2–5-flowered: glumes minutely serrulate but not ciliate; the 1st 0.75 mm. long, oblong-ovate, acutish, 1-nerved; 2d 1.5 mm. long, broadly ovate, acutish, with 3 prominent nerves: lemma 2–2.5 mm. long, firm, ovate, obtuse, or acutish, minutely serrulate, pubescent at base, 5-nerved: palea slightly shorter, oblong, blunt and erose at the slightly narrowed apex, ciliate on the nerves: anther 0.5–0.8 mm. long: grain 1.4 mm. long.— Bull. Torr. Bot. Cl. xxxv. 197 (1908); Nash in Britton & Brown, Ill. Fl. ed. 2, i. 268 (1913). *P. Borreri* Hitchc. RHODORA, x. 65 (1908); Nash in Britton & Brown, l. c. (1913). *Poa fasciculata* Torr. Fl. North. U. S. i. 107 (1824); Eaton, Man. ed. 5, 333 (1829); Beck, Bot. North. and Mid. States, 409 (1833); Wood, Class-book, 447 (1845). *P. delawarica* Link, Hort. Berol. i. 174 (1827). *P. Borreri* Hook. & Arn. Brit. Fl. ed. 8, 549 (1860). *Festuca* (*?*) *delawarica* Kunth, Gram. i. 129 (1829).

F. Borreri Bab. Trans. Linn. Soc. xvii. 565 (1837). *Glyceria Borreri* Bab. in Engl. Bot. Suppl. iii. t. 2797 (1837). *G. distans* Gray, Man. ed. 2, 560 (1856), as to synonym *Poa fasciculata* Torr., not as to description; Wood, Class-book, ed. of 1877, 799 (1877), at least in part. *Scleroch-loa Borreri* Bab. Man. Brit. Bot. 370 (1843). *S. arenaria*, var. *fasci-culata* Gray, Man. 594 (1848). *Atropis Borreri* Richter, Pl. Eur. i. 92 (1890).— Coasts of Europe; Massachusetts to Delaware, indige-nous, and sometimes adventive from Europe; Utah. MASSACHU-SETTS: salt marshes, Massachusetts, *C. Pickering* in herb. Phil. Acad.; Plum Island, Newbury, *Oakes;* beach, Brant Point, Nantucket, June 22, 1909, *N. F. Flynn* in herb. Bost. Soc. Nat. Hist. RHODE ISLAND: salt marsh, East Providence, May 30, 1911, *K. M. Wiegand*, no. 931; Wickford, June 17, 1908, *G. G. Kennedy, E. F. Williams.* CONNECTICUT: sandy place by salt marsh, West Haven, June 23, 1912, *A. E. Blewitt*, no. 339; edge of salt marsh, Woodmont, June 13, 1908, *Eames & Godfrey*, no. 5,922; salt marsh coated with sand, Orange, June 23, 1912, *C. H. Bissell;* moist sand bordering salt marsh, Stratford, June 12, 1908, *E. H. Eames*, no. 5,915, July 6, 1912, *A. E. Blewitt*, no. 355; sandy shores of Cedar Creek, Bridgeport, June 29, 1899, *Eames;* sandy border of salt meadows, within tidal influence, Westport, June 19, 1901, *Eames*, no. 160. NEW YORK: salt marshes in vicinity of New York, *Torrey* (TYPE of the species); New Lots, Long Island, June 11, 1887, *N. L. Britton.* NEW JERSEY: coast, *Nuttall;* coast, August, 1833, *A. Gray;* Hoboken, *Thurber;* Somer's Point, June, 1865, *C. E. Smith* in herb. Phil. Acad.; salt marsh, Cape May, May–July, *A. H. Smith et al.* in herb. Phil. Acad.; Swedesboro, June 2, 1895, *C. D. Lippencott* in herb. Phil. Acad.; Kaign's Point, *D. Burke* in herb. Phil. Acad. PENNSYLVANIA: Phila-delphia (various stations), *Leidy et al.* in herb. Phil. Acad. DELA-WARE: coast, *Nuttall* in herb. Phil. Acad.; Cape Henlopen, *A. H. Smith* in herb. Phil. Acad.; salt marshes, Woodland Beach, June 30, 1898, *A. Commons* in herb. Phil. Acad. UTAH: Hot Springs, June 19, 1908, *Mrs. Joseph Clemens* (distributed as *Agrostis stolonifera*).

Though occasionally found on ballast and there presumably a recent introduction from Europe, *P. fasciculata* is clearly indigenous upon our coast as well as in Europe. Its status in Utah is yet to be determined, but there it is probably a recent introduction.

4. P. **rupestris** (With.), n. comb. FIGS. 17–22. Resembling *P. fasciculata;* the decumbent culms 1–4.2 dm. high: leaves 2.5–6 mm. wide, flat: panicle ellipsoid, glaucous, 2–7 cm. long; the branches stiff and approximate, 1–2.5 cm. long, closely flowered nearly to base, distichous, scabrous: spikelets 5–8 mm. long, 3–5-flowered: 1st glume 1.5–2 mm. long, ovate, acutish, 3-nerved; the midnerve scabrous: 2d glume 2–2.5 mm. long, oval, obtuse, 3-nerved, hyaline and erose-serrulate above: lemma 3–3.5 mm. long, ovate, obtuse, thick and firm except at the narrow hyaline summit, essentially entire or minutely

serrulate at summit; the midnerve often excurrent and minutely scabrous at tip, with a few hairs at base: palea slightly shorter, linear-oblong, scarcely tapering to the bidentate or fimbriate summit, ciliate to the base with slender hairs of about uniform length: anther 0.8–1 mm. long: grain 2 mm. long.— *Poa rupestris* With. Arr. Brit. Pl. ed. 3, ii. 146, t. 26 (1796). *Poa procumbens* Curtis, Fl. Lond., fasc. vi. t. 11 (Exact date of publication not known but probably later than Withering's species. See note below). *Sclerochloa procumbens* Beauv. Agrost. 98 (1812). *S. rupestris* Britten & Rendle, Journ. Bot. xlv. 107 (1907). *Glyceria procumbens* Sm. Engl. Fl. i. 119 (1824). *Festuca procumbens* Kunth, Gram. i. 129 (1829). *Atropis procumbens* Thurb. Bot. Cal. ii. 309 (1880); Beal, Grasses Am. ii. 575 (1896).— Atlantic coast of Europe; adventive in America. Occasionally reported on ballast. Seen by us only from NEW YORK: ballast, New York, June, 1880, *Addison Brown*. NEW JERSEY: ballast, Kaign's Point, *D. Burke* in herb. Phil. Acad.; Petty's Island, July 3, 1867, *Burke* in herb. Phil. Acad.

Britten & Rendle give excellent reasons for concluding that *Poa rupestris* With. was published earlier than *P. procumbens* Curtis:— see Journ. Bot. xlv. 107 (1907). In addition to their reasoning it may be noted that Withering, in his original description (ed. 3) states merely that the plant was "Gathered on St. Vincent's Rocks, near Bristol, by Mr. Milne, who observed to me that Mr. Curtis first found it there." In his 4th edition, ii. 147 (1801) he adds, "Sir THOMAS FRANKLAND found this plant growing on the waste ground near the Dock, betwixt Bristol and the Hotwells. Also on the new Pier at Scarborough." This additional information is given in Curtis's publication and presumably taken from it by Withering (though he makes no acknowledgment) and the natural inference is that Curtis's species was published after Withering's 3rd edition and before the 4th. Also, Withering cites "Curt." in edition 4, not in edition 3.

+ + *Lemma not coriaceous; its midnerve not excurrent: lower branches of the panicle floriferous chiefly above the middle, if below loosely flowered and the panicle much elongated* (2–3 dm. long): *plants mostly perennial.*

++ *Lemmas and glumes erose-serrulate or ciliolate.*

= *Lemmas truncate-obtuse and erose-ciliolate at the broad tip, with a few hairs at base.*

5. P. DISTANS (L.) Parl. FIGS. 23–27. Culms 2–6 dm. high, rather slender: leaves green, rarely glaucous, 3.5–10 cm. long, 2–6 mm. broad, flat: panicle green or violet-tinged 0.8–2 dm. long, ovoid, lax; the

lower branches 0.3–1.3 dm. long, at first ascending, then divergent, finally deflexed, floriferous chiefly above the middle; pedicels scabrous or smoothish: spikelets 4–5 mm. long, 4–6-flowered: 1st glume 1 mm. long, 1-nerved, ovate, acutish to obtuse, minutely erose-ciliolate; 2d 2 mm. long, broadly ovate, erose-ciliolate, 3-nerved, the lateral nerves short and faint: lemma 2–2.5 mm. long, broadly ovate, faintly 5-nerved, hyaline above, obtuse or subtruncate, with a few hairs at base: palea slightly shorter, ciliate in the upper half on the marginal nerves, truncate-emarginate and erose-ciliolate at apex: anther 0.7–0.9 mm. long: grain 1.4 mm. long.— Fl. Ital. i. 367 (1848); Watson & Coulter in Gray, Man. ed. 6, 668 (1890); Britton & Brown, Ill. Fl. i. 214 (1896). *Poa distans* L. Mant. i. 32 (1767). *Glyceria distans* Wahlenb. Fl. Ups. 36 (1820); Gray, Man. ed. 2, 560 (1856), as to description. *Festuca distans* Kunth, Gram. i. 129 (1829). *Sclerochloa distans* Bab. Man. Brit. Bot. 370 (1843). *Atropis distans* Griseb. in Ledeb. Fl. Ross. iv. 388 (1853); Beal, Grasses Am. ii. 572 (1896). *Panicularia distans* Scribner, Mem. Torr. Bot. Cl. v. 54 (1894).— Eurasia and northern Africa; adventive and rapidly becoming naturalized in North America; less pronouncedly halophytic than most species. Quebec: damp magnesian gravel and mud about the asbestos quarries, Black Lake, Megantic County, August 26, 1915, *Fernald & Jackson*, no. 12,022. New Brunswick: waste ground, Pointe du Chêne, July 12, 1912, *Bartram & Long*, no. 6,919; St. John, August, 1877, *J. Fowler* in herb. Phil. Acad.; salt marshes, Carleton, September, 1877, *Fowler*. Nova Scotia: damp roadside, Sydney, Cape Breton Island, August 17, 1902, *Fernald;* ballast-heaps, Pictou, July 24, 1883, *J. Macoun*, herb. Geol. Surv. Can. no. 29,598; brackish soil, Windsor, August 22, 1902, *Fernald*. Maine: wharves and roadsides, Rockland, August 22, 1909, *Fernald*, no. 1,343. Massachusetts: Oak Island, Revere (only 1 bunch), June 15, 1908, *G. G. Kennedy;* Charlestown, June 5, 1880 and June, 1883, *C. E. Perkins;* Boston, June 28, 1879, *Faxon;* waste wet ground, South Boston, June 18, 1900, *W. P. Rich;* roadsides, North Adams, June 23 and 25, 1913, *Fernald & Long*, no. 8,798. Connecticut: borders of marshes, Orange, July 25, 1894 and June 20, 1899, *C. H. Bissell;* meadow on coast, in rather dry soil, Bridgeport, June 14, 1912, *E. H. Eames*, no. 8,528. New York: on refuse from chemical works, flats along Onondaga Lake, Syracuse, July 13, 1915, *Bissell, Ware & Weatherby*. New Jersey: wet soil near edge of marsh, Cape May, May 27 and June 10, 1911, *O. H. Brown* in herb. Phil. Acad. Pennsylvania: Navy Yard, Philadelphia, June 1, 1865, *C. E. Smith* in herb. Phil. Acad. Delaware: waste places, Wilmington, June 4, 1897, *A. Commons* in herb. Phil. Acad. Nevada: meadow near Sparks, Washoe County, June 28, 1907, *A. A. Heller*, no. 8,655 (distributed as *P. Lemmoni*); Glendale, Washoe County, June 28, 1907, *P. B. Kennedy*, no. 1,577.

Var. **tenuis** (Uechtritz), n. comb. Leaves of the culm 2 mm. wide

or less, becoming more or less involute: panicles 4–9 cm. long: lemmas 1.5–2 mm. long.— *Glyceria distans*, forma or var. *tenuis* Uechtritz in Crépin, Notes Pl. Rar. Belg. 229 (1865). *Atropis distans*, *β. tenuis* Rouy, Fl. France, xiv. 195 (1913).— Eurasia; naturalized in North America. New Brunswick: ballast-wharf, St. John, June 27, 1904, *Fernald*. Massachusetts: dry banks of Lynnway, West Lynn, June 18, 1913, *F. T. Hubbard*, no. 565. Ontario: Galt, August 24, 1901, *W. Herriot*, herb. Geol. Surv. Can. no. 26,161; along the Canadian Pacific Railway, Owen Sound, September 2, 1901, *J. Macoun*, herb. Geol. Surv. Can. no. 26,228; marshes, Sandwich, July 28, 1901, *J. Macoun*, Herb. Geol. Surv. Can. no. 26,219. Alberta: Calgary, August 7, 1915, *M. O. Malte*. Idaho: roadsides, Boise, August 18, 1911, *June A. Clark*, no. 250, *Nelson & Macbride*, no. 250. Washington: in alkali soil, Yakima City, July 10, 1897, *Piper*, no. 2,590.

6. P. **coarctata**, n. sp. Figs. 28–32. Caespitosa perennis 0.8–3 dm. alta glaucescens; culmis glabris tenuibus; foliorum caulinorum laminis planis 1–2 mm. latis 0.2–1 dm. longis; paniculis in anthesi coarctatis 2–7 cm. longis deinde sublaxis ramis inferioribus 1–3 cm. longis laxe adscendentibus, pedicellis paullo scabris; spiculis 3.5–5 mm. longis laxe 3–4-floris; glumis ovatis, inferiore 0.5–1 mm. longa 1-nervata, superiore lata 1.5–2 mm. longa 3-nervata supra hyalina ciliolata; lemmatibus ad basim sparse pilosis 2–2.5 mm. longis late ovatis obtusis supra hyalinis ciliolatis obscure 4–5-nervatis; palea 2 mm. longa oblongo-lanceolata ad apicem latum subtruncata vel bidentata, nervis sparse ciliatis; antheris 0.5–0.8 mm. longis; caryopsibus 1.4–1.7 mm. longis.

Caespitose perennial 0.8–3 dm. high, somewhat glaucous: culms glabrous, slender: cauline leaves with flat blades 1–2 mm. wide, 0.2–1 dm. long: panicles dense in anthesis, 2–7 cm. long, finally somewhat lax; the lower branches 1–3 cm. long, loosely ascending; pedicels slightly scabrous: spikelets 3.5–5 mm. long, loosely 3–4-flowered: 1st glume 0.5–1 mm. long, 1-nerved, ovate; 2d 1.5–2 mm. long, 3-nerved, broadly ovate, hyaline and ciliolate above: lemma sparsely pilose at base, 2–2.5 mm. long, broadly ovate, obtuse, hyaline and ciliolate above, obscurely 4–5-nerved: palea 2 mm. long, oblong-lanceolate, subtruncate or bidentate at the broad apex, sparingly ciliate on the nerves: anthers 0.5–0.8 mm. long: grain 1.4–1.7 mm. long.— Coasts of Labrador, Newfoundland and eastern Quebec. Labrador: Seal Island, August 12, 1892, *Waghorne*, herb. Geol. Surv. Can. no. 13,161; waste places near salt water and rocks by sea, Battle Harbor, August 6–13, 1911, *C. S. Williamson*, no. 681 in herb. Phil. Acad. Newfoundland: brackish shore of Dildo Run, Notre Dame Bay, July 7, 1911, *Fernald, Wiegand & Bartram*, no. 4,655 (type in Gray Herb.); Barred Islands, Notre Dame Bay, August 12, 1903, *J. D. Sornborger:* Funk Island, August 1, 1908, *H. S. Forbes;* crevices of damp sea-cliff, Torbay, August 21–26, 1901, *Howe & Lang*, no. 1,370;

conglomerate limestone and calcareous sandstone cliffs and ledges, Cow Head, July 23, 1910, *Fernald & Wiegand*, no. 2,615a. QUEBEC: rocky shore, Pointe Jones, Brest, Saguenay County, July 29, 1915, *St. John*, herb. Geol. Surv. Can.; rocky bank, Romaine, Lagordendière, Saguenay County, July 7, 1915, *St. John*, herb. Geol. Surv. Can.

Superficially resembling the Greenland P. **vaginata** (Lange), n. comb. = *Glyceria vaginata* Lange, Fl. Dan. t. 2583 (1858); but differing in its shorter spike (in *P. vaginata* 5–6-flowered), shorter nearly glabrous lemmas, which in *P. vaginata* are 3 mm. long and distinctly appressed-pubescent along the lower half of the nerves, and in the shorter and broader-tipped palea.

= = *Lemmas narrowed to an acute or obtuse tip, not truncate, appressed-pubescent on the nerves below.*

° *Plant whitish-green: panicle-branches smooth or nearly so: lemmas firm.*

7. P. **laurentiana**, n. sp. FIGS. 33–38. Laxe caespitosa perennis 1–3 dm. alta rigida glauca; foliorum caulinorum laminis 3–6 cm. longis involutis, vaginis basilaribus albo-brunneis; ligula 1.5 mm. longa acutiuscula; panicula 0.6–1.3 dm. longa, ramis rigidis glabriusculis adscendentibus deinde divergentibus vix deflexis; spiculis 4–6.5 mm. longis 3–5-floris albescentibus; gluma inferiore 1–2 mm. longa anguste ovata acuta 1-nervata eroso-serrulata, superiore 2–2.5 mm. longa late ovata ad apicem subacutum abrupte angustata eroso-serrulata 3-nervata nervis lateralibus brevibus; lemmatibus ovatis supra hyalinis 2.3–2.8 mm. longis abrupte acuminatis eroso-ciliolatis, nervis basim versus valde pubescentibus, nervo medio ad apicem plerumque scabriusculo; palea paullo breviore lanceolata ad apicem latum bidentata supra scabra basi ciliata; antheris 0.7–0.9 mm. longis; caryopsibus 1.5–1.8 mm. longis.

Loosely caespitose perennial 1–3 dm. high, rigid, glaucous: cauline leaves with the blades 3–6 cm. long, involute; the basal sheaths whitish-brown; ligule 1.5 mm. long, acutish: panicle 0.6–1.3 dm. long; its branches rigid, nearly glabrous, ascending or finally divergent but not deflexed: spikelets 4–6.5 mm. long, 3–5-flowered, whitish: 1st glume 1–2 mm. long, narrowly ovate, acutish, 1-nerved, erose-serrulate; the 2d 2–2.5 mm. long, broadly ovate, abruptly narrowed to the acute apex, erose-serrulate, 3-nerved, the lateral nerves short: lemmas ovate, hyaline above, 2.3–2.8 mm. long, abruptly acuminate, erose-ciliolate, very pubescent on the nerves below; the midnerve often finely scabrous toward the apex: palea a little shorter, lanceolate, bidentate at the broad apex, scabrous above, ciliate at base: anthers 0.7–0.9 mm. long: grain 1.5–1.8 mm. long.— Coasts of Bona-

venture and Rimouski Counties, QUEBEC: gravelly beach, Tracadigash Point, Carleton, July 22, 1904, *Collins & Fernald* (TYPE in Gray Herb.), July 25, 1904, *Collins & Pease* (*Pease*, no. 4,326); gravelly shore, Pointe aux Corbeaux, Bic, July 6–10, 1905, *Williams, Collins & Fernald.*

Superficially resembling *P. coarctata* and *P. vaginata.* Differing from both in the abruptly acuminate firm whitish lemmas and stiff involute leaves, and from *P. coarctata* also in the pubescent nerves of the lemmas.

°° *Plant bright-green or only slightly glaucous: panicle-branches strongly scabrous: lemmas thin.*

8. P. **macra**, n. sp. FIGS. 39–43. Caespitosa perennis (?) 4.5–6 dm. alta viridis; foliorum caulinorum laminis tenuibus planis 3–6.3 mm. latis 0.4–1.4 dm. longis superioribus longioribus, vaginis basilaribus purpurascentibus, ligula 1.5 mm. longa obtusa; paniculla lineari-cylindrica 2–3 dm. longa ante et post anthesin erecta basi vagina superiore incluso, ramis filiformibus arcte adscendentibus scaberrimis; spiculis 4–7 mm. longis 4 6-floris purpurascentibus; gluma inferiore 1.5–2 mm. longa hyalina acuta 1-nervata paullo serrulata, superiore 2–2.5 mm. longa anguste ovata obtusa eroso-serrulata 3-nervata, nervo medio ad apicem minute scabro; lemmatibus 2.5–3 mm. longis ovatis obtusis tenuibus supra hyalinis minute eroso-serrulatis 5-nervatis, nervis basin versus pubescentibus; palea 2.5–3 mm. longa oblanceolata bidentata nervis ciliatis, ciliis imis longioribus; antheris 0.9–1 mm. longis; caryopsibus 1.4–1.6 mm. longis.

Caespitose perennial (?) 4.5–6 dm. high, green: cauline leaves with blades thin, flat, 3–6.3 mm. wide, 0.4–1.4 dm. long; the upper longer than the lower; basal sheaths purplish; ligule 1.5 mm. long, obtuse: panicle linear-cylindric, 2–3 dm. long, before and after anthesis erect, the base included in the upper sheath; the branches filiform, strongly ascending, very scabrous: spikelets 4–7 mm. long, 4–6-flowered, purplish: 1st glume 1.5–2 mm. long, hyaline, acute, 1-nerved, slightly serrulate; 2d 2–2.5 mm. long, narrowly ovate, obtuse, erose-serrulate, 3-nerved, the mid-nerve minutely scabrous above: lemmas 2.5–3 mm. long, ovate, obtuse, thin, hyaline above, minutely erose-serrulate, 5-nerved, the nerves pubescent toward the base: palea 2.5–3 mm. long, oblanceolate, bidentate, ciliate on the nerves, the cilia longer below: anthers 0.9–1 mm. long: grain 1.4–1.6 mm. long.— Known only from the type station near the tip of the Gaspé Peninsula, QUEBEC: wet springy place, Bonaventure Island, August 7 and 8, 1907, *Fernald & Collins*, no. 891 (TYPE in Gray Herb.).

A rather unique plant, perhaps nearest to the local *P. nutkaensis* of Vancouver Island, from which it differs in its softer and more pubescent lemmas.

9. P. AIROIDES (Nutt.) Wats. & Coult. FIGS. 44–48. Caespitose, green or slightly glaucous; the culms slender, 2–9 dm. high: cauline leaves flat or becoming involute, 1–2 mm. wide, 2–12 cm. long: panicle 0.4–3 dm. long, from narrow and close to broad and open, the branches and pedicels strongly scabrous; the lower branches (up to 1.2 dm. long) ascending to spreading: spikelets 3.5–7 mm. long, 3–6-flowered: glumes thick, erose-ciliolate; the 1st 1.2–1.5 mm. long, narrowly ovate, acutish, 1-nerved; the 2d 1.5–2 mm. long, 3-nerved, broadly ovate, obtuse or subacute: lemmas 1.5–2 mm. long, ovate, rather abruptly contracted to a blunt or subacute apex, not truncate, thin, hyaline above, erose-serrulate, 5-nerved; the nerves pubescent below the middle: palea lanceolate, about equaling the lemma or slightly longer, ciliate on the nerves chiefly of the upper half; the lower cilia longer: anthers 0.6–0.7 mm. long: grain 1–1.2 mm. long.— Watson & Coulter in Gray, Man. ed. 6, 668 (1890); Britton & Brown, Ill. Fl. i. 215 (1896); Rydberg, Fl. Col. 48 (1906); Coulter & Nelson, Man. Bot. Rocky Mts., 74 (1909); Wooton & Standley, Contrib. U. S. Nat. Herb. xix. 104 (1915). *P. Nuttalliana* Hitchc. in Jepson, Fl. Cal. pt. 3, 162 (1912). *Poa airoides* Nutt. Gen. i. 68 (1818); Eaton, Man. ed. 5, 335 (1829). *Poa Nuttalliana* Schultes, Mant. ii. 303 (1824). *Festuca* (?) *Nuttalliana* Kunth, Gram. i. 129 (1829). *Glyceria montana* Buckley, Proc. Acad. Sci. Phila. 1862, 96 (1863). *G. airoides* Gray, Proc. Acad. Sci. Phila. 1862, 336 (1863). *G. distans* Torr. Bot. Wilkes Exped. 490 (1874); Coulter, Man. Bot. Rocky Mts. 423 (1885); not Wahlenb. *Panicularia distans airoides* Scribn. Mem. Torr. Bot. Cl. v. 54 (1894). *Atropis airoides* Holm, Bot. Gaz. xlvi. 427 (1908).— Widely distributed in the western and west-central sections of North America; adventive eastward to New England. MAINE: around wool-waste, North Berwick, June and July, 1897–1903, *J. C. Parlin*. VERMONT: Canadian Pacific Railway yards, Newport, July 26, 1904, *A. A. Eaton*, no. M226.

The synonym *Glyceria montana* is here ascribed to Buckley as author, although it is well known [1] that Buckley appropriated an unpublished herbarium-name of Nuttall's. This historical fact does not, of course, alter the bibliographic fact that the name, wisely left unpublished by Nuttall, was actually published by Buckley and as a published name should consequently be cited from his publication and not as of Nuttall.

10. P. **lucida**, n. sp. FIGS. 54–58. Laxe caespitosa 1.5–7 dm. alta viridis; foliorum caulinorum laminis 4.6–12 cm. longis involutis flaccidis, vaginis basilaribus plus minusve purpurascentibus; ligula 1.7–2.5 mm. longa acuta; panicula diffusa 1–2.5 dm. longa, basi vagina supe-

[1] See Gray, Proc. Acad. Sci. Phila., 1862, 336 (1863).

riore plerumque inclusa, ramis filiformibus scabris laxe divergentibus deinde deflexis; spiculis 5–9 mm. longis 3–5-floris pallide viridibus; glumis tenuibus lucidis, inferiore 2–3.5 mm. longa ovata acuta supra hyalina minute serrulata nervo medio scabro, superiore 2.5–4 mm. longa 3-nervata nervis evidentibus; lemmatibus 3–4 mm. longis 5-nervatis late ovatis acutis eroso-ciliolatis basin versus valde pubescentibus, pilis longis; palea 2.5 mm. longa lanceolata ad apicem latum bidentata supra scabra basi ciliata; antheris 1–1.2 longis; caryopsibus 1.8–2 mm. longis.

Loosely caespitose, 1.5–7 dm. high, green: cauline leaves with blades 4.6–12 cm. long, involute, flaccid; the basal sheaths more or less purplish; ligule 1.7–2.5 mm. long, acute: panicle diffuse, 1–2.5 dm. long, the base commonly included in the upper sheath; branches filiform, scabrous, loosely divergent, finally deflexed: spikelets 5–9 mm. long, 3–5-flowered, pale-green: glumes thin, lustrous; the 1st 2–3.5 mm. long, ovate, acute, hyaline above and minutely serrulate, with the midnerve scabrous; 2d 2.5–4 mm. long, 3-nerved; the nerves evident: lemmas 3–4 mm. long, 5-nerved, broadly ovate, acute, erose-ciliolate, strongly pubescent toward the base with long hairs: palea 2.5 mm. long, lanceolate, bidentate at the broad apex, scabrous above, ciliate below: anthers 1–1.2 mm. long: grain 1.8–2 mm. long.— Sea shores and damp (presumably alkaline) soil, Quebec, Wyoming and British Columbia. QUEBEC: brackish gravelly shore, Cacouna, August 8, 1902, *Fernald* (TYPE in Gray Herb.); mouth of Rivière du Loup, 1860, *Chas. Pickering:* salt marsh near the wharf, Ste. Anne, Kamouraska County, July 21, 1907, *F. F. Forbes;* Murray River, August 14, 1905, *J. Macoun,* herb. Geol. Surv. Can. no. 69,217 (material under no. 69,217 in Gray Herb. from "Vicinity of Cap à l'Aigle" is partly *P. lucida,* partly *P. paupercula,* var. *alaskana*). WYOMING: in the margins of ponds, Mammoth Hot Springs, July 30, 1899, *A. & E. Nelson,* no. 6,017; damp soil, Washington Ranch, June 29, 1901, *Merrill & Wilcox,* no. 63. BRITISH COLUMBIA: salt marshes, Newcastle Island, Departure Bay, July 10, 1908, *J. Macoun,* herb. Geol. Surv. Can. no. 81,001.

In some characters related to each of the three species, *P. laurentiana, P. macra* and *P. airoides.* From *P. laurentiana* and *P. airoides* separated at once by the longer, thin, lustrous lemmas; from the former also by its capillary widely divergent and very scabrous panicle-branches and the softer greener foliage; from the latter by the longer grain and the commonly less exserted panicle. From *P. macra* at once distinguished by the diffuse panicle, pale spikelets, involute leaves and longer lemmas and achenes.

++ ++ *Lemmas entire or at most remotely few-toothed, not ciliolate.*

11. P. **paupercula** (Holm), n. comb. FIGS. 63–67. Densely caespitose; culms slender, often geniculate, 0.2–2 dm. high: cauline leaves with blades 1–4 cm. long, soft, flat, 0.5–1.5 mm. wide; ligule less than 1 mm. long, acutish: panicle 1–6 cm. long; the few smooth or smoothish branches ascending, in age slightly spreading: spikelets 3–5 mm. long, 2–5-flowered: 1st glume 1–1.5 mm. long, 1-nerved, obtuse or acutish, entire; 2d 2–2.5 mm. long, 3-nerved, entire or obscurely dentate, tapering to a blunt apex: lemmas 2–2.5 mm. long, 5-nerved, tapering to a blunt apex, entire, minutely pubescent at base: palea about equaling the lemma, linear-lanceolate, truncate or somewhat bidentate at apex, slightly scabrous on the nerves above: anthers 0.5–0.7 mm. long: grain about 2 mm. long.— *P. maritima*, var. (?) *minor* Watson in Gray, Man. ed. 6, 668 (1890), as to description and Labrador plant. *Glyceria paupercula* Holm in Fedde, Repert. Spec. Nov. iii. 337 (1907).— Coasts of Labrador, Keewatin, Newfoundland and Quebec. — LABRADOR: Mansfield Island, 1884, *R. Bell* in herb. Geol. Surv. Can., no. 34,782 (TYPE of the species); Hopedale, August 4–6, 1897, *J. D. Sornborger*, no. 238 (transitional to var. *alaskana*); dry rocks, Battle Harbor, August 6, 1911, *C. S. Williamson*, no. 552 in herb. Phil. Acad.; on rocks by the sea, Blanc Sablon, July 30, 1910, *Fernald & Wiegand*, no. 2,616. KEEWATIN: Rankin Inlet, lat. 62° 45′, August 30, 1910, *J. M. Macoun*, herb. Geol. Surv. Can. nos. 79,116, 79,117. NEWFOUNDLAND: gravelly beach, Norris Arm, August 21, 1911, *Fernald & Wiegand*, no. 4,657; forming extensive turf-areas, salt marsh, Killigrew's, August 3, 1911, *Fernald & Wiegand*, no. 4,656. QUEBEC: Salmon Bay, "Labrador," July 28, 1882, *J. A. Allen* (type of *P. maritima*, var. (?) *minor*); salt marsh, Ile du Petit Rigolet, Archipel de Kécarponi, Saguenay County, August 10, 1915, *St. John*, herb. Geol. Surv. Can.; rocky beach, Pointe au Maurier, Charnay, Saguenay County, July 16 and August 24, 1915, *St. John*, herb. Geol. Surv. Can.; strand, Vieille Romaine, Archipel Ouapitagone, Saguenay County, July 13, 1915, *St. John*, herb. Geol. Surv. Can.; salt water at mouth of Matane River, Matane County, August 6, 1904, *F. F. Forbes*. MAGDALEN ISLANDS: forming turf on sandy saline shore, Basin Island, July 20, 1912, *Fernald, Bartram, Long & St. John*, no. 6,914.

Var. **alaskana** (Scribn. & Merrill), n. comb. FIGS. 68–72. Usually larger throughout, occasionally stoloniferous; culms 0.5–4.5 dm. high: leaves up to 1.2 dm. long and 2 mm. broad; ligule about 2 mm. long: panicle 0.2–1.8 dm. long, the lower branches ascending or spreading, sometimes finally reflexed: spikelets 4.5–7 mm. long, 4–6-flowered: 1st glume 1.5–2 mm. long; 2d 2.5 mm. long: lemma 2.5–4 mm. long: anther 0.8–1 mm. long; grain 1.7–2.1 mm. long, readily separating from the palea; stolons flagelliform, resembling those of *P. phryganodes*, rarely developed at flowering season.— *P. alaskana* Scribn. & Merrill, Contr. U. S. Nat. Herb. xiii. 78 (1910). *P. maritima*, var. (?) *minor*, Watson in Gray Man. ed. 6, 668 (1890), as to Mt.

Desert plant, not as to description. *P. angustata* Rand & Redfield, Fl. Mt. Desert, 181 (1894) and later authors, as to plant, not as to name-bringing synonym, *Poa angustata* R. Br.— Coasts from western Newfoundland and the lower St. Lawrence to Connecticut; Alaska and British Columbia and "Oregon." NEWFOUNDLAND: conglomerate limestone and calcareous sandstone cliffs and ledges, Cow Head, July 23, 1910, *Fernald & Wiegand*, no. 2,615; damp sandy shores, St. George's, August 13, 1910, *Fernald & Wiegand*, no. 2,614. QUEBEC: rocky shore, Ile du Havre, Mingan Islands, September 16, 1915, *St. John*, herb. Geol. Surv. Can.; brackish shores above the mouth of Dartmouth River, Gaspé County, August 26 & 27, 1904, *Collins, Fernald & Pease;* L'Anse à Griffon, Gaspé County, July 28, 1882, *J. Macoun*, herb. Geol. Surv. Can. no. 29,529; salt marsh, Cape Rosier, July 28, 1882, *J. Macoun*, herb. Geol. Surv. Can. no. 29,529; salt marshes, Ste. Anne des Monts, August 10, 1882, *J. Macoun*, herb. Geol. Surv. Can. no. 29,580; Little Métis, August 4, 1906, *J. Fowler;* various saline and sub-saline habitats, Bic, July, 1904, 1906, and 1907, *Fernald & Collins*, nos. 168, 359, 888, 889, 890; crevices of wet rocks by the St. Lawrence, Rivière du Loup, July 6, 1905, *Collins & Fernald*, no. 33; shore, Tadousac, August 7, 1892, *G. G. Kennedy;* marshes, vicinity of Cap à l'Aigle, August 14, 1905, *J. Macoun*, herb. Geol. Surv. Can. no. 69,223. MAGDALEN ISLANDS: sand-spit, Amherst Island, August 25, 1914, *St. John;* salt marsh by the Narrows, Alright Island, August 21, 1912, *Fernald, Long & St. John*, no. 6,917; gravelly beaches and brackish sands, Grindstone Island, July 18 and 22, 1912, *Fernald, Bartram, Long & St. John*, nos. 6,911, 6,912. PRINCE EDWARD ISLAND: damp brackish sand, Alberton, July 11, 1912, *Fernald & St. John*, nos. 6,916, 6,913 (dwarf form with abundant long stolons resembling those of *P. phryganodes*); salt marsh, Brackley Point, August 4, 1888, *J. Macoun*, herb. Geol. Surv. Can., no. 29,534; salt marsh, Tracadie, July 30, 1914, *Fernald & St. John*, no. 10,919; wet sand by Britain Pond, August 8, 1914, *Fernald & St. John*, no. 10,920; salt marsh, Mt. Stewart, July 30, 1912, *Fernald, Bartram, Long & St. John*, no. 6,915; salt marsh, Rocky Point, July 6, 1912, *Fernald & St. John*, no. 6,918; dryish border of salt marsh, Wood Island, July 29, 1914, *Fernald & St. John*, no. 10,918. NEW BRUNSWICK: sand bar, Miscou Island, August 26, 1913, *S. F. Blake*, no. 5,554; Bass River, Kent County, July 30, 1872, *J. Fowler*, herb. Geol. Surv. Can. no. 29,530; Kouchibouguac, August 17, 1869, *Fowler;* sand at outer edge of salt marsh, Shediac Cape, July 4, 1914, *F. T. Hubbard*, no. 695; beach sand, Shediac Island, August 5, 1914, *F. T. Hubbard*, no. 726. NOVA SCOTIA: North Sydney, July 14, 1883, *J. Macoun*, herb. Geol. Surv. Can., no. 29,528; sea-beaches, Baddeck, July 27, 1898, *J. Macoun*, herb. Geol. Surv. Can., no. 21,045; LeHave River, August 6 and 10, 1910, *J. Macoun*, herb. Geol. Surv. Can. nos. 81,493, 81,494; beach, Barrington Passage, June 20 and 24, 1910, *J. Macoun*, herb. Geol. Surv. Can., nos. 81,495, 81,498; sandy

shore, Loch Broom, July 21, 1914, *Fernald & St. John*, no. 10,917. MAINE: (common along the coast; about 70 numbers examined, of which the following are representative): strand, Pleasant Point, Perry, August 16, 1909, *Fernald*, no. 1,348; gravelly shore, Cutler, July 2, 1902, *Kennedy, Williams, Collins & Fernald;* salt marsh, Roque Bluffs, July 19, 1913, *C. H. Knowlton;* Gott's Island, July 20, 1899, *J. H. Redfield;* Mt. Desert Island, *Rand et al* (specimen from Somesville, June 13, 1883, forming part of *P. maritima*, var. (?) *minor* Watson); beach sand, Rockland, July 11, 1903, *Kate Furbish;* salt marsh, South Thomaston, August 15, 1913, *Bissell, Fernald & Chamberlain*, no. 8,799; sandy shore, Squirrel Island, August 2, 1892, *Fernald;* Horn Cove, Southport, August 4, 1894, *Fernald;* Peaks Island, June 29, 1909, *E. B. Chamberlain:* salt marsh, Great Chebeague Island, July 2, 1909, *Fernald*, no. 1,360; salt marsh, Cape Elizabeth, July 23, 1889, *Fernald;* sea-shore, Biddeford Pool, July 29, 1901, *G. G. Kennedy;* Kennebunkport, August 23, 1888, *G. G. Kennedy;* sandy shore, York, July 15, 1891, *Fernald.* NEW HAMPSHIRE: Rye, June 14, 1903, *E. F. Williams.* MASSACHUSETTS: sandy soil, shore of Menansha Creek, branch toward Gay Head, Martha's Vineyard, August 2, 1897, *S. Harris.* CONNECTICUT: shore of salt creek, Old Lyme, June 13, 1912, *C. H. Bissell, A. E. Blewitt*, no. 347. ALASKA: hillsides, St. Paul Island, August 11, 1892, *J. M. Macoun*, herb. Geol. Surv. Can. no. 29,579 (part of the original material of *P. alaskana*); Bella-bella Island, *A. Kellogg*, no. 147 in herb. Phil. Acad.; Idaho Inlet, Cross Sound, *T. Meehan* in herb. Phil. Acad. BRITISH COLUMBIA: Skidgate, Queen Charlotte Islands, July 18, 1910, *Spreadborough*, herb. Geol. Surv. Can. no. 87,622; Comox, Vancouver Island, June 27, 1893, *J. Macoun*, herb. Geol. Surv. Can. no. 243; vicinity of Ucleulet, Vancouver Island, May 16, and July 20, 1909, *J. Macoun*, herb. Geol. Surv. Can. nos. 82,335, 82,334; salt marsh, Nanaimo, Vancouver Island, June 14, 1887, *J. Macoun*, herb. Geol. Surv. Can. no. 29,538; Victoria, June 24, 1887, *J. Macoun;* salt marshes, Burrard Inlet, July 27, 1889, *J. Macoun*, herb. Geol. Surv. Can. no. 29,533. "OREGON": old specimen without further data.

Var. **longiglumis**, n. var. FIGS. 73–77. Major; culmis 3.5–7 dm. altis, ligulis 2–2.5 mm. longis; paniculis 1–2.5 dm. longis, ramis longis inferioribus patentibus vel reflexis; spiculis 6–12 mm. longis laxe 4–6-floris, rhachi flexuosa inter lemmata evidente; gluma inferiore 3–4 mm. longa obtusa vel acutiuscula, superiore 7–9 mm. longa 3–5-nervata oblongo-lanceolata acuta vel acuminata lemma proximum subaequante vel quam id longiore; lemmatibus 4.5–6 mm. longis 7-nervatis elliptico-ovatis; palea 3–4-mm. longa: antheris 0.7–1 mm. longis; caryopsibus 2.2–2.6 mm. longis.

Larger: culms 3.5–7 dm. high: ligule 2–2.5 mm. long: panicle 1–2.5 dm. long; the long lower branches spreading or reflexed: spikelets 6–12 mm. long, loosely 4–6-flowered; the flexuous rhachis visible

between the lemmas at anthesis: 1st glume 3–4 mm. long, obtuse or acutish; 2d 7–9 mm. long, 3–5-nerved, oblong-lanceolate, acute or acuminate, about equaling or longer than the adjacent lemma: lemma 4.5–6 mm. long, 7-nerved, elliptic-ovate; palea 3–4 mm. long: anthers 0.7–1 mm. long: grain 2.2–2.6 mm. long.— PRINCE EDWARD ISLAND: salt marsh, Bunbury, August 9, 1912, *Fernald, Long & St. John*, no. 6,920; border of salt marsh, Bunbury, August 28, 1912, *Fernald, Long & St. John*, no. 6,921 (TYPE in Gray Herb.).

In its extreme development (no. 6921) var. *longiglumis* seems sufficiently unlike var. *alaskana* or the tiny-flowered typical *P. paupercula* for specific separation, but numerous collections not only from Prince Edward Island but from the mainland show clear intergradation.

Var. *alaskana*, as it occurs on the Pacific coast, often has the lemmas firmer and the panicle-branches more spreading than in much of the eastern material, but both these characters reappear in many eastern colonies, leaving no character upon which the Atlantic and Pacific coast plants seem to be distinguished.

In publishing *P. maritima*, var. (?) *minor* Watson cited two specimens: "Shore of Mt. Desert Island (*E. L. Rand*); Labrador (*J. A. Allen*)." The Mt. Desert plant labeled in the Gray Herbarium by Watson is var. *alaskana*, while the Labrador plant of Allen (from Salmon Bay, Saguenay County, Quebec) is the little northern plant subsequently published by Holm as *Glyceria paupercula*. The description of *P. maritima* var. (?) *minor*, is clearly based upon the Allen plant, having "spikelets 2–4-flowered, the flowers 1″ long or less" so that the Allen plant stands as the type of var. *minor*.

Var. *alaskana* has been passing very generally in eastern America as *P. angustata*, based upon *Poa angustata* R. Br., but examination of a duplicate type of Brown's species, preserved in the Gray Herbarium, shows it to be a very distinct species, which is unknown to us from south of Arctic America. The plant is beautifully illustrated in Flora Danica, t. 3006, as *Glyceria angustata;* and it differs from all forms of the more southern *P. paupercula* in the erose-serrulate and coarsely toothed obtuse to subtruncate lemma pubescent on the nerves, and in the scabrous pedicels (FIGS. 59–62). Outside Greenland and Spitzbergen where the species has been frequently collected, it seems to be rare. We have examined American specimens from Goose Fjord, Ellesmereland, August 15, 1901, *H. G. Simmons*, no. 3,436 (herb. Geol. Surv. Can. no. 80,635); Beechy Island, Lancaster Sound,

August 24, 1908, *J. G. McMillan*, herb. Geol. Surv. Can. no. 77,271; and Melville Island, 1820, *Edwards* (original collection of *Poa angustata*).

Var. *alaskana* both in the East and the West has also been frequently identified with Presl's *Poa nutkaensis*, originally described from Vancouver Island. A fragment of the original Haenke material which was Presl's type, sent to Dr. Gray, shows, however that *Poa nutkaensis* has strongly scabrous branches and pedicels and that the glumes and lemmas are erose-ciliolate. The plant is more nearly related to *Puccinellia macra* than to any other species but differs in its firmer and less pubescent lemmas which are usually quite glabrous above the base. *Poa nutkaensis* seems to be a distinct species of the coast of Vancouver Island which should be called *Puccinellia nutkaensis*.[1]

EXPLANATION OF PLATES 114–117.

(Inflorescences × 1; details × 10).

PUCCINELLIA MARITIMA, from Rye, New Hampshire, *Robinson*, no. 683. 1. inflorescence; 2. glumes; 3. lemma and palea; 4. tip of lemma; 5. tip of palea; 6. anther.

P. PHRYGANODES, from Disco, Greenland, *Berggren*. 7. inflorescence; 8. glumes; 9. lemma and palea; 10. tip of palea; 11. anther.

P. FASCICULATA, from East Providence, Rhode Island, *Wiegand*, no. 931. 12. inflorescence; 13. glumes; 14. lemma and palea; 15. tip of palea; 16. anther.

P. RUPESTRIS, from New York City, New York, *Addison Brown*. 17. inflorescence; 18. glumes; 19. lemma and palea; 20. tip of lemma; 21. tip of palea; 22. anther.

P. DISTANS, from Boston, Massachusetts, *C. E. Faxon*. 23. inflorescence; 24. glumes; 25. lemma and palea; 26. tip of palea; 27. anther.

P. COARCTATA, from Dildo Run, Newfoundland, *Fernald & Wiegand*, no. 4,655 (TYPE). 28. inflorescence; 29. glumes; 30. lemma and palea; 31. tip of palea; 32. anther.

[1] PUCCINELLIA **nutkaensis** (Presl), n. comb. FIGS. 49–53. *Poa nutkaensis* Presl, Rel. Haenk. i. 272 (1830). *P. nootkaensis* Scribn. Mo. Bot. Gard. Rep. x. 51, t. 51, fig. 1 (1899), excluding synonyms.— Coast of BRITISH COLUMBIA, chiefly on Vancouver Island: Nootka Sound, V. I., *Haenke* (fragment of TYPE in Gray Herb.); San Juan River, V. I., August 12, 1907, *Rosendahl*, no. 2062; marshes, Victoria, V. I., June 24, 1887, *J. Macoun*, herb, Geol. Surv. Can. no. 29,531; crevices of rocks, Oak Bay, V. I., June 18, 1887, *J. Macoun*, herb. Geol. Surv. Can. no. 29,526; salt marshes, Tuxedo Island, Gulf of Georgia, June 26, 1885, *Dawson*, herb. Geol. Surv. Can. no. 29,536; salt marshes, Nanaimo, V. I., July 12, 1893, *J. Macoun*, herb. Geol. Surv. Can., no. 247; vicinity of Comox, V. I., July 5, 1893, *J. Macoun*, herb. Geol. Surv. Can. no. 245; Kitsilano, near Vancouver, August 21, 1911, *M. O. Malte*.

P. LAURENTIANA, from Tracadigash Point, Carleton, Quebec, *Collins & Fernald* (TYPE). 33. inflorescence; 34. glumes; 35. lemma and palea; 36. tip of lemma; 37. tip of palea; 38. anther.

P. MACRA, from Bonaventure Island, Quebec, *Fernald & Collins*, no. 891 (TYPE). 39. upper $\frac{2}{3}$ of inflorescence; 40. glumes; 41. lemma and palea; 42. tip of palea; 43. anther.

P. AIROIDES, from Doyle's, Colorado, *C. F. Baker*, no. 637. 44. inflorescence; 45. glumes; 46. lemma and palea; 47. tip of palea; 48. anther.

P. NUTKAENSIS, from San Juan River, Vancouver Island, *Rosendahl*, no. 2,062. 49. inflorescence; 50. glumes; 51. lemma and palea; 52. tip of palea; 53. anther.

P. LUCIDA, from Cacouna, Quebec, *Fernald* (TYPE). 54. middle half of inflorescence; 55. glumes; 56. lemma and palea; 57. tip of palea; 58. anther.

P. ANGUSTATA, from Disco, Greenland, *T. M. Fries*. 59. inflorescence; 60. glumes; 61. lemma and palea; 62. anther.

P. PAUPERCULA, from Salmon Bay, Saguenay County, Quebec, *J. A. Allen* (type of *P. maritima*, var. (?) *minor*). 63. inflorescence; 64. glumes; 65. lemma and palea; 66. tip of palea; 67. anther.

P. PAUPERCULA var. ALASKANA, from Burrard Inlet, British Columbia, *John Macoun*. 68. young inflorescence; 68a. mature inflorescence; 69. glumes; 70. lemma and palea; 71. tip of palea; 72. anther.

P. PAUPERCULA, var. LONGIGLUMIS, from Bunbury, Prince Edward Island, *Fernald, Long & St. John*, no. 6,920. 73. small inflorescence; 74. glumes; 75. lemma and palea; 76. tip of palea; 77. anther.

THE CORRECT NAME OF AN INTRODUCED SYMPHYTUM.

J. FRANCIS MACBRIDE.

IN checking up the determinations and nomenclature of the genus *Symphytum* in the Gray Herbarium, it has come to my notice that the rather generally introduced plant, that has gone under the name *S. asperrimum* Donn, must be known, for reasons of priority, as *S. asperum* Lepechin, as indicated by the following citations:

S. ASPERUM Lepechin, Nov. Act. Acad. Petrop. xiv. 444, t. 7 (1805). *S. asperrimum* Donn in Sims, Bot. Mag. t. 129 (1806). The work in which Lepechin published is in the library of the American Academy of Arts and Sciences. He gives a good description and also a fair plate, which show that there is no doubt as to the identity of his plant and that of Donn, published a year later.

Dr. Gray, Syn. Fl. ii. pt. 1, 206 (1878), mentions this species as a forage and garden plant and suggests the likelihood of its running wild; Britton, Man. Fl. N. States and Canada, ed. 3. 775 (1907), gives the American range as New York and Mass.; Britton & Brown, Ill. Fl. of the Northern States and Canada, ed. 2. iii. 92 (1913), gives range as Mass. to Maryland; Gray's Man. ed. 7, 683, states that it is "not rare."

The first American record I have found is in Dame & Collins's Flora of Middlesex Co. 74 (1888) and runs: "Ashland, escaped and sparingly established (Rev. Thos. Morong; specimen in herb. of)." The more recent records which have been found are as follows: RHODORA, i. 82 (1899) where Mabel Priscilla Cook records the species as "well established near Munroe Station," Middlesex County, Massachusetts. Edward B. Chamberlain in RHODORA, ii. 214 (1901) states that he has seen a specimen from Maine and that a printed record has been found for its occurrence in Massachusetts. In RHODORA, iv. 84 (1902), Mr. E. B. Harger gives an interesting account of the species becoming established along a roadside near his abandoned garden at Oxford, Connecticut, during the summers of 1900 and 1901, the colony having spread across the road. With the exception of the Middlesex Flora only the most recent local floras cite its occurrence. It seems to be well established now from Quebec to Connecticut as may be seen from the following stations now shown by material in the Gray Herbarium (Gr.) and the Herbarium of the New England Botanical Club (N. E.).

QUEBEC: waste places, Quebec, July 10, 1905, *J. R. Churchill* (Gr.); Wolf's Cove, Sillery, Aug. 6, 1902, *E. F. Williams* (Gr.). PRINCE EDWARD ISLAND: roadsides, Charlottetown, Sept. 2, 1912, *Fernald, Long & St. John*, no. 7956 (Gr.). MAINE: hundreds of clumps on river-terraces, Presque Isle, July 14, 1902, *Williams, Collins & Fernald* (Gr. & N. E.); Hartford, July, 1892, *J. C. Parlin* (Gr. &. N. E.); waste ground near railroad, Littleton, July 4, 1902, *Knight & Billings*, no. 12 (Gr.); Owl's Head, near Rockland, *A. H. Moore* (N. E.). VERMONT: Townshend, Aug. 17, 1911, *L. A. Wheeler* (Gr.), and June 23, 1912 (N. E.); Vernon, June 2, 1902, *W. H. Blanchard* (Gr.). MASSACHUSETTS: edge of woods and embankment of built-up road through swamp, Sherborn, July, 1909, *Miss M. L. Loomis* (Gr. & N. E.), and edge of swamp, June 8, 1911 (N. E.); roadside, Bartlet St., Andover, July 6, 1901, *A. S. Pease*, no. 1119

(N. E.). CONNECTICUT: roadside, Oxford, June 19, 1901 & 17, 1902, *E. B. Harger* (Gr.). NEW YORK: cultivated in many yards, Buffalo, *G. W. Clinton*, no. 4 (Gr.).

Since Lepechin, the authority for the binomial which must be revived, is a name not familiar to most American botanists, it may not be out of place to mention that he was a professor of botany and director of the Imperial Gardens at St. Petersburg during the last half of the eighteenth century. His name was connected with American botany, fourteen years after his death, by Willdenow's publication in 1816 of the genus *Lepechinia*, a group of Mexican mints.

GRAY HERBARIUM.

RHODODENDRON MAXIMUM IN NEW HAMPSHIRE.

W. G. FARLOW.

LAST August Mr. J. W. Robertson, a resident of Chocorua, N. H., informed me that he had seen growing on the ridge lying between Mt. Chocorua and Mt. Paugus, a plant which he thought might be *Rhododendron maximum*. As that species had not before been recorded in New Hampshire north of Fitzwilliam near Mt. Monadnock, I asked Mr. Robertson to send me if possible specimens of leaves and twigs that the determination might be verified. He was so good as to send me in November fresh specimens which showed that the plant was certainly *R. maximum*. According to Mr. Robertson there are three patches of the plant on the spruce ridge that lies half a mile above the Half-way House between the Liberty Path and the Brook Trail on Mt. Chocorua at an altitude of about 1500 ft.

Although the phaenogamic flora of Chocorua is less interesting than that of some other places in the neighborhood of the White Mountains, it may be desirable that I should add a note in regard to a few plants which I have collected on different occasions. On the summit of Mt. Chocorua the only plant of interest is *Paronychia argyrocoma*, var. *albimontana*. More interesting is *Pogonia trianthophora* (*P. pendula*) which is abundant under beech trees near Lake Chocorua in the middle

of August. Last summer it was especially common owing probably to the rainy season. To those accustomed to regard *P. ophioglossoides* as the typical representative of the genus, *P. trianthophora* has an unexpected habitat growing only in fallen leaves, the bulbous base and roots lying loose among the fallen leaves and not fixed in the ground. *Utricularia resupinata* appears to be a rare plant. I found it only once in small numbers in sand with Gratiola just below the dam at the foot of Lake Chocorua. This appears to be the locality where it was collected by Dr. C. W. Swan, Aug. 1888, according to a specimen in the herbarium of the N. E. Bot. Club. In the rapidly flowing water close by grows the rare alga, *Hormospora purpurea* Wolle, a species whose position is still doubtful.

The maritime *Hudsonia tomentosa* I have never found at Chocorua but it is rather common on the west shore of Lake Ossipee close to the cottages of the summer camp growing with *Prunus cuneata* and a Solidago which Prof. Fernald informs me is the maritime *S. tenuifolia* and not the *S. graminifolia* common by roadsides in the region. The strand flora of the numerous small lakes in and about Chocorua differ in some interesting respects from that of Lake Ossipee and some of the lakes, as Lovell's Pond in Fryeburg, which lie to the northeast. It seems to me that an interesting trip would be to follow the chain of lakes extending from Conway and Fryeburg to the Kezar Ponds farther north but I have never had the time to explore that region.

The fern-flora of Chocorua, contrary to the statements of summer visitors, is poor and uninteresting if we except the *Ophioglossaceae*. I found a considerable quantity of *Ophioglossum vulgatum* in the meadow opposite the Hotel, *Botrychium lanceolatum* and *B. ramosum* are not uncommon and *B. obliquum* in several varieties and *B. ternatum* are very common, the latter more luxuriant than I have ever seen it elsewhere. With the exception perhaps of Sarracenia no plants have so astonished different foreign botanists, who have visited Chocorua, as the abundance of the different species of Lycopodium. We who have always seen them have become more or less indifferent to them but there is probably no place in the world where the northern temperate Lycopodia can be better seen than in the region of Chocorua where even the European species are more abundant than in Europe except in rare localities. *Isoëtes Tuckermani* is common in several places in Lake Chocorua.

CAMBRIDGE, MASSACHUSETTS.

Amsinckia in the northeastern United States.— In ordering up the genus *Amsinckia* in the Gray Herbarium I have discovered that the species introduced and apparently somewhat naturalized about Southington, Connecticut, is not *A. lycopsoides* Lehm., as supposed, but *A. barbata* Greene. Until now, Greene's species has been known only from Vancouver Island and has the general aspect of *A. lycopsoides* as that species has been commonly interpreted. However, *A. barbata* is very well marked, possessing salient characters which are not found in any other one species: the sepals are bearded along the edges with soft white hairs and the large nutlets are carinate and sharply muriculate without being rugose except toward the tip. Mr. Luman Andrews collected *A. barbata* at Southington in 1895 and from a note accompanying the specimen it is evident that the plant was first noticed in that locality in 1892. It was secured by Mr. C. H. Bissell in 1897 and 1898, and in 1899 Mr. Andrews mentioned it in Rhodora, i. 104, as "a recent introduction but.... well-established" at Southington. The "Flowering Plants and Ferns of Connecticut," issued in 1910, gives two additional stations, viz., Hartford (*Bissell*), and Salisbury (*Mrs. C. S. Phelps*), but I have not seen these latter specimens.

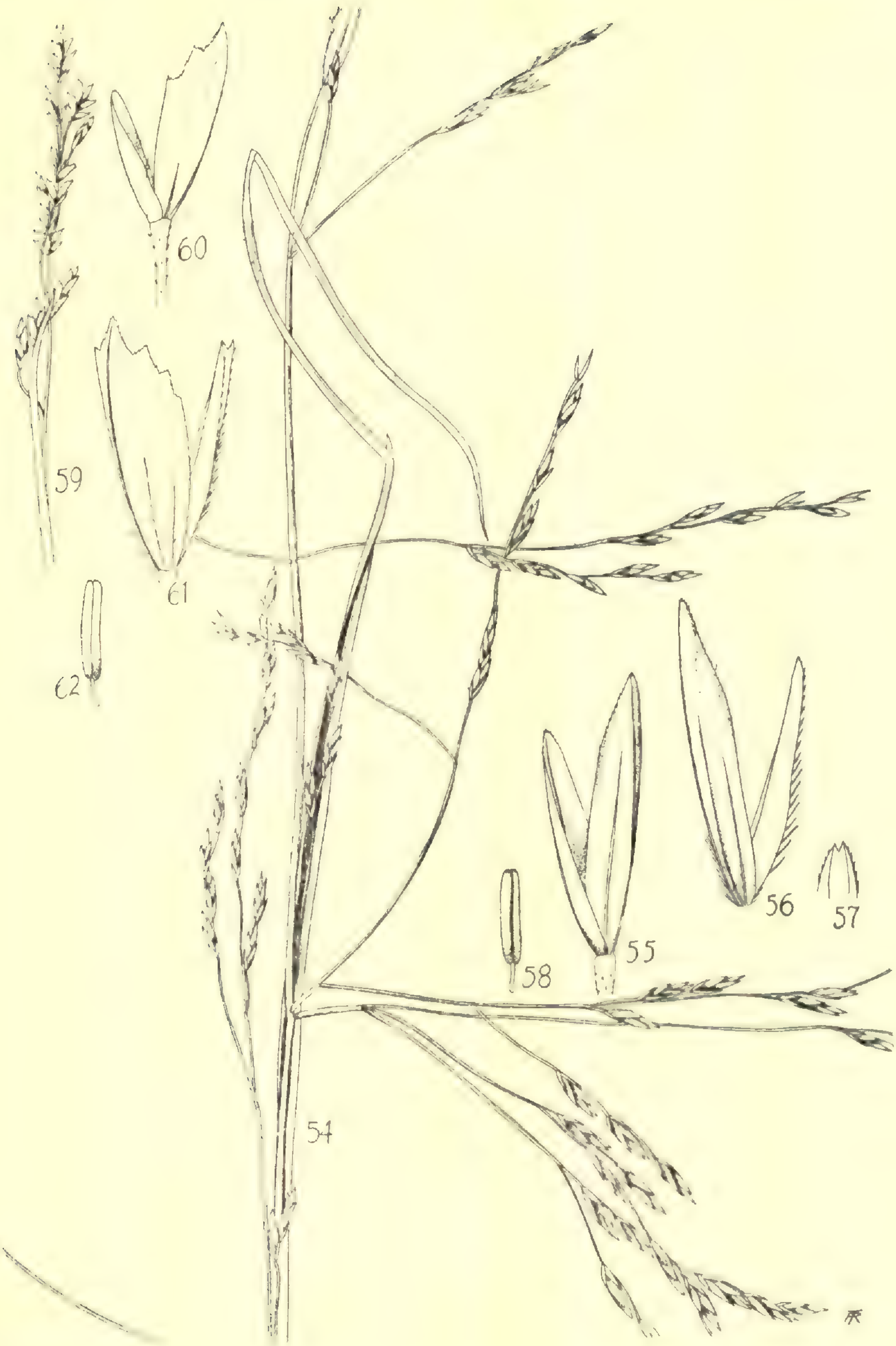
The first published record of the introduction of this genus seems to be by Rev. William P. Alcott in the Bulletin of the Essex Institute, xiii. 6 (1881). He there includes *A. spectabilis* F. & M. in a list of "Introduced plants found in the vicinity of a wool-scouring establishment" at North Chelmsford (near Lowell), Massachusetts. He mentions that it was "very abundant." In Dame and Collins's Flora of Middlesex County, Massachusetts, 75 (1888) Alcott's specimen and also one from Lowell, secured by Dr. F. Nickerson, are listed as *A. intermedia* F. & M. The Herbarium of the New England Botanical Club contains one specimen from Lowell collected at Chase's Woolen Mills in 1880 by Miss M. Swan. In the seventh edition of Gray's Manual this specimen is included in *A. lycopsoides* and the range of this species is given as "locally established, eastern Massachusetts to Connecticut." However, it is with no little hesitation that I refer this specimen to the same species as the one established at Southington, Connecticut (i. e. *A. barbata*). The Lowell plant has smaller more rugose nutlets and accrescent sepals. It is spindling, however, and gives the impression of abnormal development. On the other hand it is entirely possible that all the Lowell specimens,

considering the various names they have gone under, represent another species. Local botanists should look for the plant next July and if it still persists secure it in quantity in good fruiting condition. Britton & Brown, Ill. Fl. ed. 2, iii. 84 (1913) records *A. intermedia* as sparingly introduced on Long Island and about Nantucket. If one may judge from their brief characterization it seems probable that this is rather *A. Douglasiana* DC. Other species that are essentially weedy in character in their native habitats, such as *A. tessellata* Gray, are to be expected in the eastern States.— J. FRANCIS MACBRIDE, Gray Herbarium.

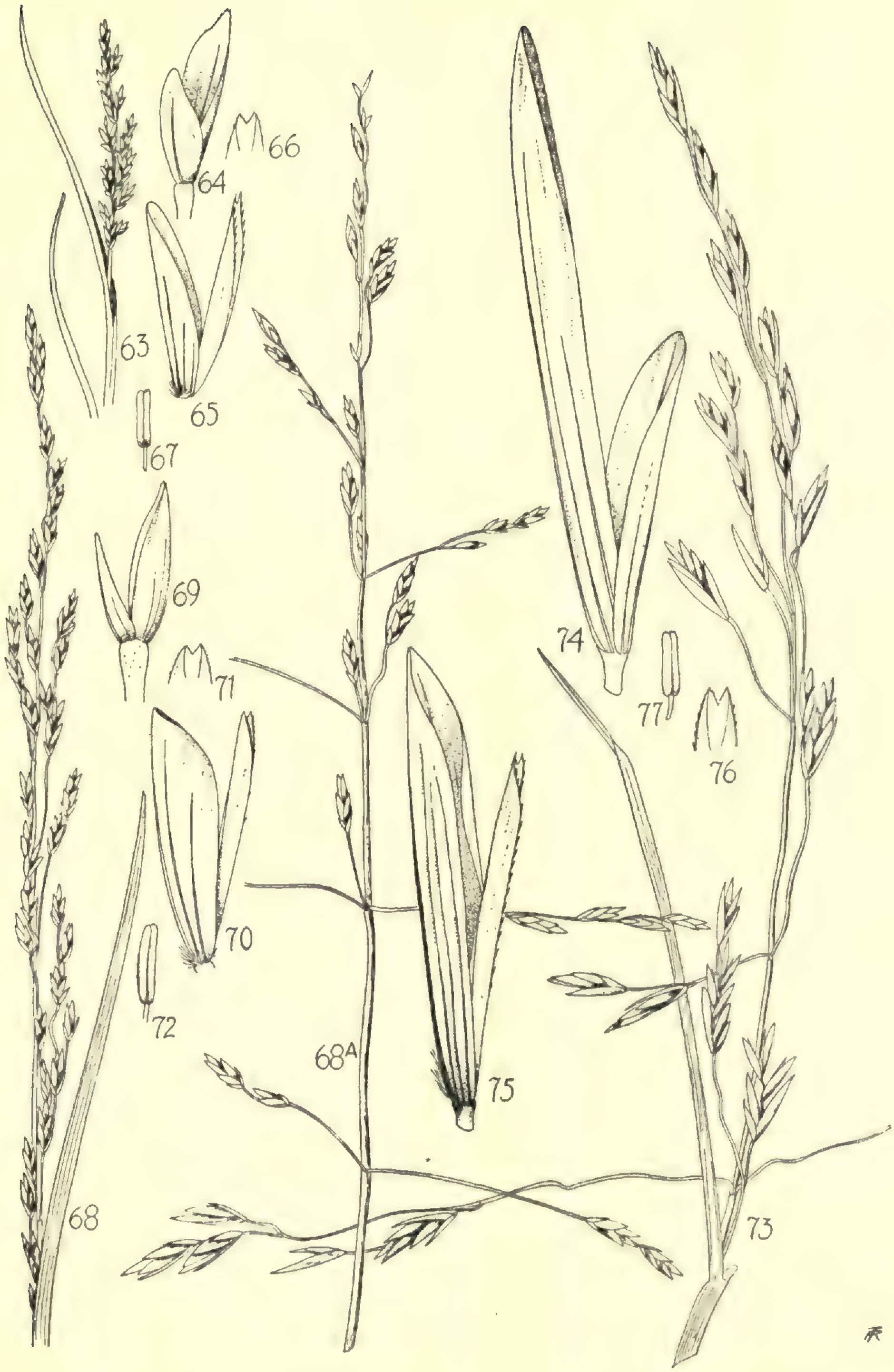
Vol. 17, no. 204, including pages 229 to 252 and title-page of the volume, was issued 6 January, 1916.

Figs. 1–6, *Puccinellia maritima;* 7–11, *P. phryganodes;* 12–16, *P. fasciculata;* 17–22, *P. rupestris;* 23–27, *P. distans.*

Figs. 28–32, *Puccinellia coarctata;* 33–38, *P. laurentiana;* 39–43, *P. macra;* 44–48, *P. airoides;* 49–53, *P. nutkaensis.*



Figs. 54–58, *Puccinellia lucida;* 59–62, *P. angustata.*



Figs. 63–67, *Puccinellia paupercula;* 68–72, *P. paupercula,* var. *alaskana;* 73–77, *P. paupercula,* var *longiglumis.*

Rhodora

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PLANTS COLLECTED ON MATINICUS ISLAND, MAINE, IN LATE FALL, 1915.

W. L. McAtee.

While on official business for the United States Biological Survey, the writer spent two weeks (October 26 to November 7, 1915) on Matinicus Island, Maine. Weather conditions hampering the work planned, much of the time was employed in collecting plants, and specimens were taken of all vascular species observed.

Matinicus Island, about 2 miles long and of varying width, has an area of 720 acres. It is 18 miles out from Rockland, and appears to have a greater variety of vegetation than any of the other islands that far from the mainland. The shores are mostly rock bound, but there are three sand beaches extensive enough to furnish favorable habitat for sand-loving plants. Although the general surface of the island is well elevated, there are numerous bogs and marshes, and at least two extensive deposits of peat, sections of both of which are exposed at the shore.

The plants that fix the character of the landscape on Matinicus are the abundant spruces, and the low grasses (*Agrostis*, *Poa*) that so largely make up the splendid turf that covers most of the unwooded areas. Shrubs that are almost omnipresent in the woods are blueberry, huckleberry, and bunchberry, and outside, bayberry and juniper. Certain situations have very characteristic assemblages of plants, as the sandy beaches with *Ammophila*, *Atriplex*, and *Salsola*, the gravelly beaches with *Mertensia maritima*, *Arenaria peploides robusta*, and *Polygonum fowleri*, the boulder beaches or rocky shores with *Lathyrus maritimus*, *Oenothera muricata*, *Coelopleurum*, *Ligusti-*

cum, *Glaux*, *Triglochin*, and *Spartina*. The bogs have *Chiogenes*, *Vaccinium oxycoccos*, various sedges and rushes, skunk cabbage, and *Nemopanthus*. Habitats for aquatic plants on Matinicus are very limited, there being only two ponds. One is artificial and contains one intentional and probably other accidental introductions. The natural conditions for aquatic plants probably are well represented by Black Duck Pond, a small shallow pool pent up by the highest beach ridge and fed by seepage from springy ground. The plants occurring here are *Sparganium angustifolium*, *Potamogeton oakesianus*, *P. epihydrus*, *Scirpus occidentalis*, and an interesting submerged *Juncus* (*articulatus*).

Plants evidently without ecologic niches are *Equisetum arvense* and *Viburnum cassinoides*, both being found on shore, in marshes, pastures and woods.

Observations were necessarily incomplete because of the season at which the island was visited. Much more could be learned at a more favorable time of year. However, botanizing in late fall is not without its peculiar advantages. For instance the number of plants that were found in bloom at this northern locality during the first week of November was surprising. There were no fewer than 53 dicotyledonous plants flowering; how many monocots there may have been was not ascertained — *Spiranthes cernua* was the only conspicuous one. The 53 species mentioned represent 20 families; Compositae include 20 of the species, Cruciferae 5, and Leguminosae, Violaceae, and Labiatae 3 each. In how many cases blossoming should be regarded as a secondary autumnal anthesis is uncertain, but probably in only 7 of the 53 species. For the others the season was normal or an extension of the normal due to the unusually prolonged mild weather.

The total number of species of vascular plants obtained is 217 representing 52 families. The Compositae have 29 species, the Gramineae 18, Rosaceae 18, Ericaceae 12, Cyperaceae 10, and the Pinaceae, Polygonaceae, Caryophyllaceae and Labiatae 7 each. Seventeen families are represented by only a single species each. Besides the species actually collected by the writer, the following were credibly reported from the island: *Larix laricina* (Du Roi) Koch (the only known tree cut down a few years ago), *Acorus calamus* L. (the rootstocks sugared for sale), *Erythronium americanum* Ker, *Drosera rotundifolia* L. (used for healing sore lips), *Monotropa uniflora* L., and *Eupatorium perfoliatum* L.

Corroborative testimony is to the effect that most of the cleared portions of the island were once covered by a dense stand of yellow birch and rock maple. Only one maple (doubtfully native) now remains.

The only publications dealing with the plants of Matinicus Island are the following: (1.) by Arthur H. Norton: "Some noteworthy plants from the islands and coast of Maine." (RHODORA, 15, pp. 137–143, August, 1913), which records *Sparganium angustifolium* Michx., *Euphorbia polygonifolia* L., *Empetrum nigrum* L. and *Teucrium canadense littorale* (Bickn.) Fernald, two of which are additional to the following list; and (2.) "The genus Euphrasia in North America" (RHODORA, 17, pp. 181–201, October, 1915), wherein *Euphrasia purpurea*, var. *farlowii* forma *iodantha* n. f. is described from a specimen collected on Matinicus by A. H. Norton.

LIST OF SPECIES.[1]

POLYPODIACEAE.

POLYPODIUM VULGARE L.— Common on moss-covered rocks in woods.

PTERIS AQUILINA L.— Very common; only a few protected plants remaining green.

ASPIDIUM CRISTATUM (L.) Sw.— Frequent along woodland paths.

ASPIDIUM SPINULOSUM (O. F. Müller) Sw.— Common along woodland paths; a few plants long established in a well curb; var. AMERICANUM (Fischer) Fernald also collected.

DICKSONIA PUNCTILOBULA (Michx.) Gray.— In wet shady woods.

ONOCLEA SENSIBILIS L.— Common in marsh near beach.

OSMUNDACEAE.

OSMUNDA REGALIS L.— Common; all plants browned by frost.

OSMUNDA CINNAMOMEA L.— "BUCKHORN."[2] Common in swamps.

EQUISETACEAE.

EQUISETUM ARVENSE L.— "MARE'S TAIL." Common.

[1] Identifications of the plants here listed were either verified, or as in a majority of cases, originally made by Professor M. L. Fernald to whom the writer is greatly obliged.

[2] The English names cited are those actually in local use which are not often noted in manuals.

LYCOPODIACEAE.

LYCOPODIUM CLAVATUM L.— "EVERGREEN." Only one colony found along dry fence row under spruces.

PINACEAE.

PINUS STROBUS L.— One small deformed tree found in a rocky pasture.

PINUS RIGIDA Mill.— Numerous gnarled trees present on a rocky hill near harbor and on Northeast Point. At the latter locality, in particular, the trees are badly deformed and numbers have been killed by the wind.

PICEA CANADENSIS (Mill.) B. S. P.— "CAT, SKUNK or BLUE SPRUCE. Abundant.

PICEA RUBRA (Du Roi) Dietr.— "COMMON, WHITE, or YELLOW SPRUCE." Abundant.

ABIES BALSAMEA (L.) Mill.— Rather common but local.

JUNIPERUS COMMUNIS L. var. DEPRESSA Pursh.— Abundant, full of fruit.

JUNIPERUS HORIZONTALIS Moench.— Local; three colonies found. Called "GROUND or RUNNING CEDAR." This species is often collected on ledges and rocky headlands, but its habitat on Matinicus is pastures; where it creeps and at times almost conceals itself among the grasses. This habit probably suggested the name "SLINK WEED" cited by Norton. On Monhegan Island, it is known as "TRAILING YEW."

TYPHACEAE.

TYPHA LATIFOLIA L.— Occupies one large marsh near old harbor almost exclusively and is scattered elsewhere.

SPARGANIACEAE.

SPARGANIUM AMERICANUM Nutt.— In Ice Pond; mature fruit.

SPARGANIUM ANGUSTIFOLIUM Michx.— In Ice and Black Duck Ponds; mature fruit.

NAIADACEAE.

Potamogeton oakesianus Robbins.—In Ice and Black Duck Ponds.

Potamogeton epihydrus Raf.—In Black Duck Pond.

Potamogeton pusillus L.—In Ice Pond; mature fruit and winter buds.

Zostera marina L.—In protected coves and tidepools; in latter stunted scarcely exceeding 20 cm. in length.

JUNCAGINACEAE.

Triglochin maritima L.—In crevices, rocky shore; mature fruit.

GRAMINEAE.

Panicum huachucae Ashe.—In wet peaty pasture, mature fruit, Nov. 2; on exposed shore, plants only 4.5 cm. long, fruits fallen, October 30.

Setaria glauca (L.) Beauv.—In gardens; mature fruit.

Anthoxanthum odoratum L.—Mature fruit.

Hierochloë odorata (L.) Wahlenb.—"Indian or Sweet Grass." Common in a marsh near beach, lighter green than surrounding vegetation. Formerly used by Indians for basketry; used by present inhabitants to repel clothesmoths.

Phleum pratense L.—Here the name "Herds grass" is actually in use.

Agrostis alba L.—Abundant. Var. maritima (Lam.) G. F. W. Mey. also collected; mature fruit.

Agrostis hyemalis (Walt.) B. S. P.—Fruit mostly fallen.

Calamagrostis canadensis (Michx.) Beauv.—Common in marshes; mature fruit.

Ammophila arenaria L. "Thatch," a name introduced from England. An extensive colony on sandy northeastern shore; mature fruit.

Spartina michauxiana Hitchc.—In strict clumps on rocky shore; mature fruit.

Spartina patens (Ait.) Muhl.— About edges of tide pools rocky shore; mature fruit.

Danthonia spicata (L.) Beauv.— Common; glumes empty.

Poa annua L.

Poa pratensis L.— Both common.

Glyceria canadensis (Michx.) Trin.— Bogs; glumes empty.

Agropyron repens (L.) Beauv.

Agropyron tenerum Vasey.— Both with mature fruit.

Elymus virginicus L.— "Wild Oats"; mature fruit.

CYPERACEAE.

Eleocharis obtusa (Willd.) Schultes.— Common; mature fruit.

Eleocharis tenuis (Willd.) Schultes.— Mature akenes exposed.

Scirpus occidentalis (Wats.) Chase.— In Black Duck and Ice Ponds; mature fruit.

Scirpus cyperinus (L.) Kunth.— Common in bogs; mature fruit.

Eriophorum virginicum L.— Common in bogs.

Rynchospora alba (L.) Vahl.— Mature fruit.

Carex stellulata Good. var. excelsior (Bailey) Fernald.

Carex paupercula Michx. var. irrigua (Wahlenb.) Fernald.— Abundant in bogs.

Carex oederi Retz. var. pumila (Cosson & Germain) Fernald.

Carex lurida Wahlenb.— All species of *Carex* had mature fruit.

ARACEAE.

Symplocarpus foetidus (L.) Nutt.— Spathes ready for the spring opening were numerous in some of the bogs.

JUNCACEAE.

Juncus bufonius L.— Common along wet paths.

Juncus dichotomus Ell. var. platyphyllus Wiegand.

Juncus balticus Willd. var. littoralis Engelm.— On wet rocky shore.

Juncus effusus L. var. compactus Lejeune & Courtois.—Common in bogs.

JUNCUS BREVICAUDATUS (Engelm.) Fernald.—In bogs.

JUNCUS ARTICULATUS L.—In bog. An interesting submerged form [1] is abundant in Black Duck Pond. All species of *Juncus* had mature fruit.

IRIDACEAE.

IRIS VERSICOLOR L.—Plants with mature capsules very common.

SISYRINCHIUM ANGUSTIFOLIUM Mill.—Numerous in dry rocky pasture; some seeds yet remaining in capsules.

ORCHIDACEAE.

HABENARIA CLAVELLATA (Michx.) Spreng.—Old plants with entire capsules numerous in bogs.

SPIRANTHES CERNUA (L.) Richard.—Common in flower, some plants under 7 cm. in height.

EPIPACTIS REPENS (L.) Crantz var. OPHIOIDES (Fernald) A. A. Eaton.—Basal leaves only of small plants collected.

SALICACEAE.

SALIX DISCOLOR Muhl.

SALIX PETIOLARIS Sm.

POPULUS TREMULOIDES Michx.—"POPPLE." In swamp and on rocky hillside.

MYRICACEAE.

MYRICA GALE L.—The most luxuriant plant observed was among rocks very near the sea.

MYRICA CAROLINENSIS Mill.—Abundant, full of fruit.

MYRICA ASPLENIFOLIA L.—Uncommon.

BETULACEAE.

BETULA LUTEA Michx.

BETULA ALBA L. var. PAPYRIFERA (Marsh.) Spach.—Of the birches

[1] Identification confirmed by F. V. Coville.

this species tends to be restricted to dry situations and the other to wetter places.

Alnus incana (L.) Moench.

URTICACEAE.

Urtica lyalli Wats.— One colony on rocky shore; mature fruit.

POLYGONACEAE.

Rumex crispus L.— The common dock of fresh water marshes, etc.; mature fruit.

Rumex pallidus Bigel.— The beach dock; mature fruit.

Rumex acetosella L.— Common.

Polygonum fowleri Robinson.— Only one mat observed; on beach; immature fruit.

Polygonum aviculare L. var. littorale (Link) Koch.— On tennis court; flowers to immature fruit.

Polygonum hydropiper L.— In bogs; mature fruit.

Polygonum persicaria L.— "Heart's ease." In gardens, flowers to mature fruit. Decoctions of this plant and of pennyroyal are used as driving potions, as in measles and colds, also for pain in general.

CHENOPODIACEAE.

Chenopodium album L.— In gardens; mature fruit.

Atriplex patula L. var. hastata (L.) Gray.— Common along shore; mature fruit.

Salsola kali L.— On sandy beaches; mature fruit.

CARYOPHYLLACEAE.

Spergularia rubra (L.) J. & C. Presl.— The typical form occurs in dense tufts or colonies of short plants on bare banks along shore; occasionally one encounters a long lax variety referable to var. perennans (Kindb.) Robinson. Referred to this also is a compact fleshy mat collected in a wet peaty pasture; mature fruit.

SPERGULA ARVENSIS L.— In gardens; immature fruit.

SAGINA NODOSA (L.) Fenzl var. GLANDULOSA (Bess.) Asch.— Old plants, capsules empty.

ARENARIA PEPLOIDES L. var. ROBUSTA Fern.— Some large mats present on the beaches.

STELLARIA BOREALIS Bigel.— Mature fruit.

STELLARIA MEDIA (L.) Cyrill.— Flowers to mature fruit.

CERASTIUM VULGATUM L.— Common; flowers to mature fruit.

NYMPHAEACEAE.

CASTALIA ODORATA (Ait.) Woodville & Wood.— Ice pond; purposely introduced.

RANUNCULACEAE.

RANUNCULUS ACRIS L.— Still in bloom everywhere in wet soil.

THALICTRUM POLYGAMUM Muhl.— Akenes still hanging to old plants in marsh near beach.

COPTIS TRIFOLIA (L.) Salisb.— "YELLOW-ROOT." On Sphagnum-covered knolls. Used in treatment of canker, sore-throat, and indigestion.

CRUCIFERAE.

CAPSELLA BURSA-PASTORIS (L.) Medic.— Gardens; flowers to mature fruit.

CAKILE EDENTULA (Bigel.) Hook.— "WILD PEPPER GRASS." Beaches; flowers to mature fruit.

BRASSICA NIGRA (L.) Koch.— Gardens; flowers to mature fruit.

BRASSICA CAMPESTRIS L.— Stubblefield; flowers and immature fruits.

SISYMBRIUM OFFICINALE (L.) Scop.— Gardens and flower-beds; flowers and immature fruits.

CARDAMINE PENNSYLVANICA Muhl.— Young plants, submerged, Ice Pond.

SAXIFRAGACEAE.

RIBES HIRTELLUM Michx. var. CALCICOLA Fern.— "SKUNK CURRANT." A few leaves left on the bushes.

ROSACEAE.

Spiraea latifolia Borkh.— Many leaves persisting on sheltered plants.

Spiraea tomentosa L.— A few leaves still hanging.

Pyrus communis L.— A young tree along a stone wall, undoubtedly escaped, had very stiff and thorny branches.

Pyrus malus L.— Numerous escaped trees.

Pyrus arbutifolia (L.) var. atropurpurea (Britton) Robinson.— "Shore berry." Common in swamps; full of fruit.

Pyrus americana (Marsh.) DC.— "Roundwood or Roundwood Tree." One tree in spruce woods, and several on an open rocky hillside.

Amelanchier oblongifolia (T. & G.) Roem.— "Wild pear."

Fragaria virginiana Duchesne.— Numerous plants in flower in upland pasture.

Potentilla monspeliensis L.— Pastures and gardens; flowers to mature fruit.

Potentilla pennsylvanica L.— On bluff rocky shores; mature fruit.

Potentilla tridentata Ait.— Pastures.

Potentilla anserina L.— Among rocks near shore.

Rubus idaeus L. var. aculeatissimus (C. A. Mey) Regel & Tiling. — Common, some old dry fruit remaining.

Rubus pergratus Blanchard.— Common.

Rubus setosus Bigel.— The most common *Rubus;* immature (red) fruit rather plentiful.

Rubus procumbens Muhl.— In wet woods.

Rosa humilis Marsh.— Common; full of fruit. Leaves on some bushes still green.

Prunus pennsylvanica L.— On rocky hillside.

LEGUMINOSAE.

Trifolium pratense L.

Trifolium repens L.

Trifolium procumbens L.— "Shamrock." All three species of clover were in bloom.

LATHYRUS MARITIMUS (L.) Bigel.—Common, pods empty.

LATHYRUS PALUSTRIS L. var. PILOSUS (Cham.) Ledeb.—Less common than last.

GERANIACEAE.

GERANIUM ROBERTIANUM L.—Seen only near shore, and under rose-bushes; grazed off elsewhere?

EMPETRACEAE.

EMPETRUM NIGRUM L.—"PIGEON BERRY." "HEATH." Rather widely distributed in bogs, and woods, but most abundant on bluffs near the sea.

COREMA CONRADII Torr.—Common on rocky bluffs, tending to occupy a zone back of the *Empetrum* mats.

ANACARDIACEAE.

RHUS TYPHINA L.—One plant among boulders on exposed beach.

RHUS VERNIX L.—"MERCURY." Common in swamps; fruit present.

AQUIFOLIACEAE.

ILEX VERTICILLATA (L.) Gray.—"DOG BERRY." "PIGEON BERRY." "WHITE ALDER." Common, full of fruit.

NEMOPANTHUS MUCRONATA (L.) Trel.—In bogs.

BALSAMINACEAE.

IMPATIENS BIFLORA Walt.—"CELANDINE." Among buildings about harbor. Flowers to mature fruit; juice used in treating *Rhus* poisoning.

MALVACEAE.

MALVA ROTUNDIFOLIA L.—Barnyards; flowers to mature fruit.

HYPERICACEAE.

Hypericum majus (Gray) Britton.— Mature fruit.

Hypericum canadense L.— Mature fruit; plants under 10 cm. high were found with 11 capsules, and under 4 cm. in height with 7 capsules.

VIOLACEAE.

Viola cucullata Ait.

Viola septentrionalis Green.

Viola primulifolia L.— This and the preceding two species were found in a wet peaty pasture, and in all stages from flower to mature fruit.

Viola pallens (Banks) Brainerd.— This is the common violet of shaded situations, but was not found in flower.

ONAGRACEAE.

Epilobium angustifolium L.— "Moose-tongue." A young plant was found in a clearing, and frayed remains of numerous old ones on a rocky hillside.

Epilobium adenocaulon Haussk.— With weeds near a store; mature fruit.

Oenothera muricata L.— "Scabious." On or near the beach; flowers to mature fruit. Used in making poultices for sores.

Oenothera pumila L.— Garden; mature fruit.

ARALIACEAE.

Aralia hispida Vent.— Bare stems found on rocky wooded hillside.

UMBELLIFERAE.

Cicuta maculata L.— Fruit remaining on old plants in marsh near beach.

Ligusticum scothicum L.— Found both in woods and among rocks along shore; mature fruit.

Coelopleurum actaeifolium (Michx.) Coulter & Rose.—"Wild parsnip." On the rugged sea bluffs it frequents, with its large leaves and the contrasted lacy white and green flowers, and the abundant brown fruits borne on stocky stems 2 inches in diameter at base, and from 4 to 5 feet high, this species appears a truly magnificent herb.

Heracleum lanatum Michx.— Fruits fallen.

Daucus carota L.— Still in flower.

CORNACEAE.

Cornus canadensis L.— Several plants seen in flower; one shoot with 5 whorls of leaves collected.

ERICACEAE.

Chimaphila umbellata (L.) Nutt.

Moneses uniflora (L.) Gray.— "Snowdrop."

Pyrola secunda L.— These three *Pyroleae* were scarce in rocky woods.

Kalmia angustifolia L.— "Mountain Laurel." Abundant; mature fruit.

Gaultheria procumbens L.— "Boxberry." Common in openings among spruce; immature fruit.

Chiogenes hispidula (L.) T. & G.— "Sugar plum," "Snowberry," "Moxie Vine." Common on sphagnum mounds.

Gaylussacia baccata (Wang.) C. Koch.— Abundant; fruit in all stages from green to ripe plentiful.

Vaccinium pennsylvanicum Lam.— Abundant; a few flowers seen; Varieties angustifolium (Ait.) Gray and myrtilloides (Michx.) Fern., also collected.

Vaccinium corymbosum L. var. amoenum (Ait.) Gray.— Common.

Vaccinium vitis-idaea L. var. minus Lodd. "Woods or Highland Cranberry." Common.

Vaccinium oxycoccos L.— "Hog Cranberry." Common in sphagnum. Fruit present; noticeably more speckled in appearance than large cranberry.

Vaccinium macrocarpon Ait.— "Bog or Marsh Cranberry."

Fruit present. Leaves of plants of bogs have 3 times more surface area than those of plants from open marshes. Grows in pools and marshes very near salt water.

PRIMULACEAE.

LYSIMACHIA TERRESTRIS (L.) B. S. P.— Edge of ice pond; with numerous bulblets.

LYSIMACHIA NUMMULARIA L.— "MYRTLE." House yard.

GLAUX MARITIMA L. var. OBTUSIFOLIA Fern.— In crevices rocky shore; mature fruit.

CONVOLVULACEAE.

CONVOLVULUS SEPIUM L. var. PUBESCENS (Gray) Fern.— Unopened capsules remaining on dead vines, gravelly beach.

BORAGINACEAE.

MERTENSIA MARITIMA (L.) S. F. Gray.— "BLUE IRIS." Common; mats 5 to 6 feet in diameter on the beaches; flowers to mature fruit.

LABIATAE.

SCUTELLERIA GALERICULATA L.— Marsh near beach; seeds fallen; used as a nerve medicine.

NEPETA HEDERACEA (L.) Trevisau.— In woods, uncommon.

PRUNELLA VULGARIS L.— "BLUE LUCY." Common in pastures and boggy places; flowers to mature fruit.

GALEOPSIS TETRAHIT L.— Flowers to mature fruit.

LEONURUS CARDIACA L.— Near house, in flower; used to relieve pain.

HEDEOMA PULEGIOIDES (L.) Pers.— Scarce; mature fruit.

LYCOPUS UNIFLORUS Michx.— In wet places; mature fruit.

SOLANACEAE.

SOLANUM NIGRUM L.— Gardens; flowers to mature fruit.

SCROPHULARIACEAE.

Linaria canadensis (L.) Dumont.— Common, widespread; flowers to mature fruit; one plant only 6 cm. high bore ripe capsules.

Chelone glabra L.— Mature capsules remaining on plants in marsh near beach; used to induce sweating.

Veronica americana Schwein.

Rhinanthus crista-galli L.— Capsules remaining on old plants in marsh near beach.

PLANTAGINACEAE.

Plantago major L.— Door-yards; bruised leaves used in treating *Rhus vernix* poisoning.

Plantago decipiens Barneoud. — "Goose-tongue," "Nova Scotia Greens." Abundant in various situations near shore.

Plantago lanceolata L.— Common in yards; all plantains had mature fruit.

RUBIACEAE.

Galium claytoni Michx.— Submerged in Ice Pond, also threaded through rushes and sedges in bogs.

CAPRIFOLIACEAE.

Linnaea borealis L. var. americana (Forbes) Rehder.— "Cinnamon vine," "Eglantine." Abundant in woods and bogs; one plant seen in flower.

Viburnum cassinoides L.— "Tea-berry." Common.

Sambucus canadensis L.— "Stinking Elder." Common; one large clump retained most of its leaves and had an abundance of immature (red) fruit; one tree 4 inches in diameter near ground.

LOBELIACEAE.

Lobelia inflata L.— Edge of garden; in flower.

COMPOSITAE.

Solidago bicolor L.— Mature fruit.

Solidago sempervirens L.— Common along shore; flowers to mature fruit.

Solidago rugosa Mill.— Common in old fields and pastures; flowers to mature fruit; a plant under 10 cm. in height bore 10 flower heads. Var. villosa (Pursh) Fernald also collected.

Solidago nemoralis Ait.— Cultivated field; in full flower, on ripe akenes.

Aster lateriflorus (L.) Britton.— Common; in flower.

Aster novi-belgii L.— "Summer farewell." Abundant; flowers to mature fruit. Var. laevigatus (Lam.) Gray also collected.

Aster acuminatus Michx.— Leaves only.

Anaphalis margaritacea (L.) B. & H.— Common; involucres empty.

Gnaphalium uliginosum L.— Common in a bare rocky pasture; involucres empty.

Ambrosia artemisiifolia L.— Gardens; flowers to mature fruit.

Bidens frondosa L.— Edge of Ice Pond; mature fruit.

Achillea millefolium L.— Common; flowers to mature fruit.

Achillea occidentalis Raf.— Occasional among rocks, delicate and fern-like; flowers.

Anthemis cotula L.— "Stinking Mayweed." Barnyards; flowers to bare involucres.

Matricaria suaveolens (Pursh) Buchenau.— Among weeds near store; in flower.

Chrysanthemum leucanthemum L. var. pinnatifidum Lecoq & Lamotte.— In flower in rocky pasture.

Tussilago farfara L.— Basal leaves only; numerous in one locality on bare bank along shore.

Senecio sylvaticus L.— Fairly common; mature fruit.

Arctium minus Bernh.— Barnyards; in flower.

Cirsium lanceolatum (L.) Hill.— Near old houses and barns; flowers to mature fruit.

Cirsium arvense (L.) Scop.— In wet places and near shore.

Leontodon autumnalis L.— "Arnica."— Typical form and var. pratensis (Link) Koch. Common in gardens and fields; flowers to mature fruit.

TARAXACUM OFFICINALE Weber.— Very common, flowers seen.

SONCHUS ASPER (L.) Hill.— In gardens and fields; flowers to mature fruit.

PRENANTHES TRIFOLIOLATA (Cass.) Fern.— Basal leaves only; in woods.

PRENANTHES ALTISSIMA L.— Among rocks, along shore; in the axils of the withered leaves of thick stem there were many short clusters of flowers, giving the appearance of fresh flowers springing from a dead plant.

HIERACIUM AURANTIACUM L.— Common in a few fields.

HIERACIUM PRATENSE Tausch.

HIERACIUM CANADENSE Michx.— Gardens; all of the hawkweeds exhibited all stages from flowers to mature fruit.

BIOLOGICAL SURVEY, Washington, D. C.

THE NAME OF THE RED OAK.

C. S. SARGENT.

IN the one hundred and ninety-fourth issue of RHODORA (February 1915) I showed that the name *Quercus rubra* Linnaeus (*Species Plantarum*, 996) belonged to the tree which was later called *Quercus falcata* by Michaux and not to the tree which has always been called Red Oak in the northern states. This change of name is one of the most unfortunate which the study of the old specimens of American plants has made necessary, for the Red Oak is one of the very few North American trees which has not been burdened with a variety of surplus names. That Linnaeus did not understand the tree which he called *Quercus rubra* is further shown by the fact that in his herbarium are two sheets of American Oaks collected by Kalm which therefore might have been before him when the first edition of the *Species Plantarum* was published. The two sheets were labeled by Linnaeus "*rubra.*" On the first sheet there is a branch with half-grown leaves and withered catkins of staminate flowers. The name "*palustris*" was written on this sheet by J. E. Smith. Judging by the truncate base of the leaves it is a specimen of *Quercus coccinea* rather than of *Q. palustris:* it

certainly does not represent any form of the Red Oak. On the second sheet there is a branch with four fully grown leaves and a single detached leaf. This was also called "*palustris*" by Smith and also represents, I believe, *Quercus coccinea*. There are photographs of these specimens in the herbarium of the Arboretum.

The earliest description of the northern Red Oak appears to be that of Plukenet in the *Almagestum Botanicum* (p. 309, t. 54, f. 5, not f. 1 as quoted by Linnaeus) published in 1696. Catesby's *Quercus Caroliniensis virentibus venis muricata* (i. 21, t. 21, f. 1), judging by the figure of a single leaf and of an acorn also well represent the Red Oak. Linnaeus's "Quercus foliorum sinubus obtusis: angulis acutis seta terminatis, intermediis vix tridentatis, margine integerrimo" in the *Hortus Cliffortianus* (p. 448) is based on the description and figures of Plukenet and Catesby, and on a specimen presumedly from Clifford's garden now preserved in the British Museum. Of this specimen there is a photograph in the herbarium of the Arboretum. This is a leaf of the Red Oak and it was on this specimen and on the description in the *Hortus Cliffortianus* that Linnaeus based his *Quercus rubra*, var. β in the *Species Plantarum* which, as I suggested, in Rhodora last year, is our northern Red Oak.

As the name *Quercus rubra* Linnaeus must be transferred to the tree which later was called *Quercus falcata* by Michaux, the Red Oak of the southern states, another must be found for the common northern Red Oak. The Gray Oak, as Michaux called it, which I believe is only a variety of this tree and which is common in the north, was distinguished by him in his *Histoire des arbres forestières de l'Amérique septentrionale* as *Quercus ambigua*. This tree only differs from the more widely distributed and more common form of the Red Oak with broad shallow cups of the fruit by its usually smaller acorns with deeper cups. The two trees often grow together; in habit, bark and foliage they cannot be distinguished, and individual trees with fruit intermediate between the two in size and in the shape of the cups are not rare. Although the tree with the deep cups is most common along the northern border of the United States and in Canada, it extends into western New York and a specimen collected by Cocks in St. Tammany Parish, Louisiana, is clearly this northern tree.

There is some doubt about the correct name for the Gray Oak. The younger Michaux who first distinguished it called it *Quercus ambigua*. There was, however, an earlier *Quercus ambigua* used for a

Mexican species by Humboldt & Bonpland. This fact was recognized in the first English translation[1] of a part of Michaux's book and the name *Quercus borealis* was there substituted for it. Although the fact is not stated very clearly, this change was evidently made or suggested by Michaux himself, for the translator says,—"This (the name *ambigua*) which I have adopted in the French edition, circumstances have compelled me to change; MM^rs. Humboldt & Bonpland having previously applied it to an Oak of New Spain. I have therefore substituted the name *borealis*, as it grows further to the north than any of the Oaks of North America." It is probably right, therefore, to credit Michaux fils with the combination *Quercus borealis* which should be adopted for the Red Oak species, for although Humboldt & Bonpland's *Quercus ambigua* is now considered a synonym of another species it is not impossible, judging from their plate in the *Plantae Aequinoctiales*, that with fuller knowledge of the Mexican Oaks than we now possess it will be shown that it is a distinct species.

Quercus borealis being used as the name for the Red Oak, it is desirable to distinguish by a varietal name the tree with the large acorns and the broad shallow cups, that is the Red Oak, as all modern authors have understood it. There were two varietal names given to this tree in 1785,[2] Marshall's var. *maxima* and Lamarck's var.

[1] This first English translation of a part of the younger Michaux's *Histoire des arbres forestières de l'Amérique septentrionale* appears to be little known. It is not found in the catalogues of the libraries of the British Museum or in that of the Royal Gardens at Kew. Pritzel describes the first English edition of the work as being in four volumes, giving the date of publication as 1817–1819, and it is possible therefore that he considered this earlier translation as a first volume of Hillhouse's English edition, which is really in three volumes. It is an octavo volume of two hundred and sixty-eight pages without illustrations and is devoted entirely to the Oaks. The title-page differs from that of the Hillhouse edition only in the omission of the names of several scientific societies following the name of Michaux, in the difference of the date of publication which is 1817, the date of Hillhouse's edition being 1819, and in the place of publication which, although the book was printed in Paris, is given as Philadelphia where it was sold by Thomas Dobson-Solomon Conrad. Both of these editions were printed in Paris by C. D'Hautel, but the names of the booksellers are omitted from the title-page of the Hillhouse edition. There is a preface by Hillhouse to his edition dated Paris 1819, but there is no preface to this 1817 edition, and the English translation of Michaux's introduction has an entirely different phraseology in these two editions. I have not been able to discover the name of the translator of the 1817 fragment which was probably prepared in Paris and then abandoned on account of the appearance of the Hillhouse translation. That it was not made by Hillhouse would seem to be shown by the fact that, although he placed the name of "*borealis*" at the head of the article on the Gray Oak he failed to change "*ambigua*" to "*borealis*" in the body of the article and made no reference to the reason for the change of name given in the 1817 edition. The same mistake occurs also in J. J. Smith's Philadelphia edition of 1865.

[2] The date on the title-page of the first volume of the *Encyclopedie Méthodique* is 1783, but it is stated in the Catalogue of the Library of the British Museum that this volume was issued in two parts and that the second part, which must have contained the article on the Oaks, did not appear until 1785.

latifolia. There is no means of knowing which was actually published first; and as there is an error in Lamarck's citation of synonyms and some vagueness in his description of the cup of the fruit, it seems best to take up Marshall's name as his description clearly refers to the common Red Oak.

If my idea that *Quercus borealis* and *Quercus rubra* of modern authors are varieties of one species, to be distinguished as such, is correct, the name of the species is *Quercus borealis* Michaux fils and the name and synonymy of the variety is as follows:

QUERCUS BOREALIS, var. **maxima**, nov. comb.

Quercus rubra, *β* Linnaeus, *Spec.*, 996 (1753).

Quercus rubra Du Roi, Harbk. Baumz. ii. 265 (excl. syn. Linnaeus & Catesby, not Linnaeus, t. 5, f. 2 [1772]) and all later authors.

Quercus rubra maxima Marshall, Arbust. Am. 122 (1785).

Quercus rubra, *α latifolia* Lamarck, *Encycl. Meth.* i. 721 (excl. syn. Plukenet) (1785).

ARNOLD ARBORETUM.

STAMINODY OF THE PETALS IN AMELANCHIER.

C. A. WEATHERBY.

LAST spring I saw, for the first time in the field, the little shad-bush with reduced petals which has been called *Amelanchier oblongifolia*, var. *micropetala* by Dr. Robinson,[1] *A. nantucketense* by Mr. Bicknell,[2] and a hybrid of *A. oblongifolia* and *A. stolonifera* by Prof. Wiegand.[3] Since this was my first sight of it, I examined it with more than usual care and presently noticed that, in many of the tiny petals, the margins were inrolled and of a yellowish hue for a certain distance on each side. Subsequent examination of the inrolled portion showed it to be thinner than the rest of the petal and of a different cell-structure; and, in the latter respect as well as in color, to be precisely similar to the walls of the anther. Moreover, it contained more or less granular matter

[1] Rhodora x. 33.
[2] Bull. Torr. Bot. Club xxxviii. 453.
[3] Rhodora xiv. 133.

which, under the microscope, proved to be indistinguishable in appearance from pollen-grains.

I have since examined the readily available herbarium material of the small petaled plant — about a dozen sheets in all, from Blue Hill in Milton, Mass., from Nantucket and from various localities in Connecticut. Every one shows the same condition to a greater or less extent. I have not seen the actual specimens from which Mr. Bicknell described *A. nantucketense*, but the fact that he speaks of the petals as "often involute"[1] indicates that it is not unlike the rest. The degree to which modification of the petals has progressed varies in different individuals and in different flowers on the same shrub — even in the same flower. Some are oblanceolate to obovate and show only an inrolling of parts of the margin; others possess more fully-formed anther-sacs and have a narrow claw and a short, sub-orbicular blade, suggestive of filament and anther in outline, but petaloid in texture; in still others, the lower part of the claw has the heavier texture of true filaments; and in a few, the whole has the texture of the true stamens and can be distinguished from them only by the broader and flatter filament, the longer anther-sacs and the broad connective, corresponding to the blade of the petal.

Such a series of structures could, of course, be produced in the comparatively common phenomenon of "doubling" — the transformation of stamens into petals. But in that case one would expect to find the usual number of normal petals in addition to the partially developed ones, and a reduction in the number of stamens corresponding to the number of the latter. No such condition appears. Whether modified or not, the petals are five and no more; and the number of stamens, though variable, as usually in *Amelanchier*, averages about the same as in normal flowers. It seems plain, then, that we have here a case of transformation of petals into stamens, and that to this teratological tendency is due the dwarfing of the petals in this puzzling plant. What the underlying cause of the tendency may be, I cannot now suggest. This note is published in the hope that others may be moved to make observations of the plant in the field, to see if any evidence of disease or other external cause can be found. I noticed none in my one meeting with the growing plant; but I was not then looking for it.

East Hartford, Conn.

[1] l. c. 454.

ANCHUSA IN NEW ENGLAND.

J. Francis Macbride.

The genus *Anchusa* is not included in any of the floras covering New England although it has been known locally for twenty years. *A. officinalis L.* was collected by Prof. J. F. Collins at Providence, Rhode Island, July 2, 1895. On October 8, 1897, Mr. Sidney Harris secured it on waste ground bordering the Fens, Boston; and September 20, 1899, Judge Churchill collected it on a "dump" at the beach at Fairfield, Connecticut. These three collections were referred to *Lycopsis arvensis* L., a plant which closely simulates, in aspect, *A. officinalis*. In Rhodora, iii. 214 (1901) Mr. Edward B. Chamberlain mentions the specimen from Providence under its correct name, and in the same publication [x. 154 (1908)], Mr. William P. Rich, in an entertaining article on "City Botanizing," in which he bases his observations on plants growing wild in Boston, records *A. officinalis* as occurring "on several gravelly banks in August and September." He indicates that he mistook it for *Lycopsis arvensis* L., and is indebted to Dr. E. H. Eames for the correct determination. The genera *Anchusa* and *Lycopsis* are, indeed, very closely related and some of the more recent European botanists have united them. Men who have treated the group monographically, however (and these include some of the greater botanical students) without exception maintain both genera. *Anchusa* as so far represented in America, at least, may be distinguished from *Lycopsis* (in addition to the straight corolla) by the character of a flat receptacle; the nutlets of *L. arvensis* are attached to a more or less elevated gynobase.

The following specimens, cited from the Gray Herbarium (Gr.) and the Herbarium of the New England Botanical Club (N. E.), seem to indicate that the plant is locally well established, particularly at Boston and at Fairfield, Connecticut. However, the fact that no additional stations are given for its occurrence in "The Flowering Plants and Ferns of Connecticut" 329 (1910), would lead one to believe that it is not inclined to spread rapidly, since, as observed above, Judge Churchill found it at Fairbanks as early as 1899.—Massachusetts: Back Bay region, Boston, Oct. 8, 1897, *Sidney Harris* (N. E.); Sept. 15, 1901, *W. P. Rich* (Gr.); June 23, 1903,

E. F. Williams (Gr.); Oct. 9, 1906, *A. S. Pease* (N. E.); June 24, 1908, *C. H. Knowlton* (Gr. & N. E.). RHODE ISLAND: "north cove lands," Providence, July 2, 1895, *J. F. Collins* (N. E.). CONNECTICUT: "Dump" on the Beach, Fairfield, Sept. 20, 1899, *J. R. Churchill* (N. E. & Gr.); Aug. 17, 1900, *E. H. Eames* (N. E.) and July 8, 1907 (N. E.).

Another plant, very closely related to *A. officinalis*, was collected Sept. 7, 1903, by Dr. O. W. Knight on a railroad embankment at Bangor, Maine, and in RHODORA, vi. 91 (1904) he mentions this collection. Two years later Dr. Knight (l. c. viii. 72) wrote that the plant, "though not spreading seems to hold forth where first found by us." No later report seems to have been published, but if one may judge from *A. officinalis* L., there is little doubt about the plant becoming established. Therefore it seems advisable to call attention to the relationship of the two introductions. The Maine specimen was reported (l. c.) as *A. arvalis* Reichenb. This species has often either been reduced to *A. officinalis*, or ignored by makers of European manuals. However, Schinz & Thellung in Naturf. Ges. Zürich, liii. Heft. iv. 557 (1909), have treated Reichenbach's plant as a variety of *A. officinalis*, identifying it with *A. angustifolia* of Linnaeus. According to this disposition its name is *A. officinalis* L. var. *angustifolia* (L.) A. DC. Rouy, in Rouy & Foucaud's Flore de France, x. 288 (1908), also regarded *A. arvalis* as only a variety of *A. officinalis*, but he used Reichenbach's name varietally and referred *A. angustifolia* L. to another species. Schinz & Thellung, however, on the testimony of Rob. N. Rudmose Brown, who is monographing the genus, show that the identity of *A. angustifolia* L. Sp. Pl. 133 (1753) is with Reichenbach's species.

It seems to me that this disposition is justifiable. At least our European material shows that many intergrades occur between the two forms. The variety, typically, has a looser inflorescence, even the later flowers becoming remote in fruit, the leaves are more or less distinctly denticulate, and the calyx-divisions are less connivent over the fruit. The correct name, then, for the plant introduced at Bangor, Maine, is *Anchusa officinalis* L., var. *angustifolia* (L.) A. DC.

GRAY HERBARIUM.

A pubescent Form of Salix Uva-ursi.— The common matted willow, *Salix Uva-ursi* Pursh, of the granitic alpine summits of northern New England, the Adirondacks, and the region northward to Labrador has its small crowded leaves quite glabrous, glaucous beneath but dark green and lustrous above; so that the bearberry-like carpets make conspicuous glistening mats on the mountain crests. In the White Mountain region the shrub abounds on the Presidential and Franconia Ranges and is generally quite typical; but near the base of the western spur of Mt. Lincoln are considerable carpets which at once arrest the attention by their dull whitish color. Examination shows that in these colonies the foliage, instead of being glabrous, is canescent with a close somewhat arachnoid but persistent pubescence. In this character the pubescent shrub of Mt. Lincoln simulates some of the Arctic-alpine species of Gaspé, Newfoundland and Labrador, *S. cordifolia* Pursh for instance, but in all other characters it seems to be pure *S. Uva-ursi;* and the beautifully definite key-character, of glabrous foliage, which has so long separated it from some other species of the North now unfortunately becomes weakened. This extreme form may be called

Salix Uva-ursi Pursh, forma **lasiophylla**, n. f., foliis pubescentibus, pilis canescentibus plus minusve arachnoideis.

Leaves with more or less arachnoid canescent pubescence.— New Hampshire: granitic gravel and peaty slopes, western spur of Mt. Lincoln, Franconia, August 11, 1915, *Fernald*, no. 11,665 (type in Gray Herb.).— M. L. Fernald.

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LIMONIUM IN NORTH AMERICA AND MEXICO.

S. F. Blake.

(Plates 118 and 119.)

The first mention of a North American Sea Lavender in literature seems to have been made by Gronovius[1] in 1743. This record, based on Clayton's number 573, now in the British Museum, was included by Linnaeus[2] in the synonymy of *Statice Limonium* in the first edition of the Species Plantarum. Clayton's specimen has a peculiar calyx not matched by any other specimen examined and may be a hybrid of *L. carolinianum* and *L. trichogonum*.

Walter's *Statice caroliniana*, described from the coast of Carolina in 1788, was retained by Pursh and Nuttall but synonymized with *S. Limonium* by other early writers on American botany. Boissier in 1848 recognized it as distinct but confused two species under the name. Eight years later it was reduced by Gray to varietal rank under *S. Limonium*, a disposition maintained in the Synoptical Flora and in the sixth edition of Gray's Manual. Ever since its original publication the name has almost universally been considered to apply to the common northeastern species with a rather large calyx strongly pilose on the ribs and with acuminate lobes, but examination of Walter's type in the British Museum shows it to belong to the southern plant with smaller quite glabrous calyx with deltoid obtuse lobes which recent authors, following Gray, have identified with *Statice brasiliensis* Boiss.[3] Type material of the latter in the Kew Her-

[1] Gron. Fl. Virg. ed. 1. 150 (1743).
[2] L. Sp. i. 274 (1753).
[3] Boiss. in A. DC. Prod. xii. 644 (1848).

barium, however, differs widely in its verrucose branches and other characters from the plant of our southern coast, and the name *Limonium brasiliense* or *Statice brasiliensis* should disappear from the North American list. In the second edition of Britton & Brown's Illustrated Flora the range of "*L. carolinianum*" (not the plant of Walter) is extended to include Bermuda, thereby implying its identity with *L. Lefroyi* (Hemsl.) Britton [1] (*Statice Lefroyi* Hemsl.), which Wangerin [2] had already suggested in 1911. The type of that species in the Kew Herbarium, collected by Sir J. H. Lefroy at Walsingham, Bermuda, as well as other Bermudan material examined, represents a different species with the lobes of the villous-ribbed calyx merely short-deltoid, obtusish, and mucronulate, and our common plant of the northeast is left unprovided with a name.

In Boissier's monograph [3] of *Statice* (= *Limonium*) in 1848 two species were recognized from North America — *S. caroliniana*, a mixture as to specimens of *Limonium angustatum* (Gray) Small, and of the northeastern species with strongly pubescent calyx to which Boissier's description exclusively applies; and the new *S. californica* from San Francisco (*Barclay*) and Santa Clara (*Sinclair*). In 1878, in the Synoptical Flora, Gray also recognized two species — the European *S. Limonium* L., represented in America by var. *caroliniana* and var. *californica*, and *S. brasiliensis* (= true *S. caroliniana*) with the new var. *angustata* from Florida. In 1897 Small raised var. *angustata* to specific rank under *Limonium*, and described *L. Nashii* from Florida, and in the following year *L. limbatum* from Texas and New Mexico, the latter said to be distinguished from *L. californicum* among other features by the "calyx. . . tube hirsute" in opposition to the "calyx. . . tube glabrous" of *L. californicum*, despite Boissier's description of *S. californica* as with the calyx-tube "ad 5 costas breviter hirsuto." This error is repeated in Small's Flora, where the species called *L. californicum* is apparently the one here described as *L. mexicanum*.

An important review of the *Statice Limonium* group has recently

[1] Britton, Journ. N. Y. Bot. Gard. vi. 154 (1905). *Statice Lefroyi* Hemsl. Journ. Bot. xxi. 105 (1883); Voy. Challenger Bot. i. pt. 1. 47. t. 4 (1884). The petals are described by Hemsley as shorter than the calyx-tube, but good material collected by *F. S. Collins* at the type locality (no. 244) shows this to be an incorrect observation due probably to the over-maturity of Hemsley's type. The petals are lavender and exceed the calyx by 1–1.5 mm.

[2] Wangerin, Zeitschr. Naturw. Halle lxxxii. 429 (1911).

[3] Boiss. in A. DC. Prod. xii. 634 et seq. (1848).

been published by Wangerin,[1] who recognizes, in addition to the new *Statice Endlichiana* from Tamaulipas, the first species of the genus to be described from Mexico, six North American Species — *S. angustata* ("Small" = Gray) Wangerin, *S. brasiliensis* Boiss. (not seen from North America by Wangerin), *S. caroliniana* Walt., *S. californica* Boiss., *S. Nashii* (Small) Wangerin, and *S. limbata* (Small) Wangerin. Wangerin's discussion of the variation of these species, which is accompanied by a key and brief synonymy, makes this a very important contribution to the knowledge of the American species of the genus.

All the North American species are closely related to one another and belong to the sect. *Limonium* § *Genuinae* of Boissier's revision. The chief characters for specific discrimination are to be found in the pubescence, size, and form of the calyx-tube, in the shape of its lobes, the shape of the flowering bractlets, and the degree of aggregation of the flowers.

The generic name to be used for this genus in accordance with the International Code of Nomenclature is at present in some dispute, American authors using *Limonium* while English and Continental authorities for the most part still adhere to the usage of Boissier, applying *Statice* to the Sea Lavenders and using *Armeria* Willd. for the Thrifts, basing their case on the clause of Art. 45 of the International Rules which states that when a genus having no subdivision which can be regarded as its type is divided into two, the original name shall be retained for the segregate having the greater number of species. The history of the case in brief is as follows. The two genera were distinguished in their modern acceptation by Tournefort in 1700, and described and figured in his Institutiones (i. 341. t. 177). Linnaeus united them in the Genera Plantarum (ed. 1. 88. no. 252 (1737); ed. 5. 135. no. 348 (1754)) under the name *Statice*, quoting *Limonium* as a synonym, and remarking in his observations under the genus "Statice *authorum* calyce communi *triplici, florem subrotundum componit.* Limonium *authorum* calyce communi *imbricato flosculos serie oblonga exhibit.*" Of the thirteen species of *Statice* in the first edition of the Species (i. 274) one only, the first, is a Thrift, the others Sea Lavenders. The first binomialist to separate them was Miller, who in his Gardener's Dictionary ed. 8 (1768) returned to

[1] Wangerin, Zeitschr. Naturw. Halle lxxxii. 401–445 (1911).

the genera as proposed by Tournefort, as he had in the non-binomial Gardn. Dict. Abr. ed. 4 (1754), and as the non-binomialists Hill (Brit. Herb. 343, 345 (1756)) and Adanson (Fam. ii. 283 (1763)) did also. Miller reckons twelve species of *Limonium* and only three of *Statice*, and the proportion was nearly the same in the case of Hill and Adanson, so that if the provision of Art. 45 relating to the numerical composition of the segregates of a genus were strictly followed the name *Statice* would have to be used for the Sea Lavenders. It is a satisfaction to find a loophole of escape from this course, so repugnant alike to justice and to common sense in that the act of Miller (or Adanson) is taken as determining the application of the name (*Statice*) while his own use of it is absolutely reversed, in Linnaeus' notes on his combined genus quoted above. His "Statice authorum" and "Limonium authorum" even if not given definite rank can certainly, as Druce [1] has recently argued, be considered as subdivisions which came within the meaning of Art. 45 and fix the typical group of the genus, and the names *Limonium* and *Statice* be retained in their modern, which is also their original sense, in place of *Statice* and *Armeria* of Willdenow.[2] It should be noted that Willdenow's names are in point of priority in conflict with *Taxanthema* Neck.[3] (1790) for *Statice* Willd.,[4] and *Polyanthemum* Medic.[5] (1791) for *Armeria*, and that the case will probably have to come before the next International Botanical Congress for settlement.

In the preparation of the present revision the material in the British Museum, the Kew Herbarium, and the Gray Herbarium,

[1] Druce, Journ. Bot. liii. 357 (1915).

[2] Willd. Enum. Hort. Berol. i. 333, 335 (1809).

[3] Neck. Elem. i. 115 (1790).

[4] The dubious genus *Plegorhiza* Mol. (Sag. Chil. "ed. 1. 164, 351 (1782)"; ed. 2. 140, 287 (1810)) was mentioned by Philippi many years ago ("Anal. Univ. Chil. 1861, 58"; Linnaea xxxiii. 220 (1864–65)) as a probable synonym of his *Statice chilensis*, and later compilers (Ind. Kew., Dalla Torre & Harms, Post & Kuntze) have followed him in referring the name to the synonymy of *Statice* Willd. (*Limonium*). Aside from the essential identity of Molina's vernacular name for his genus, "Guaycuru" — which, however, as Molina remarks, "proviene dalla lingua del Paraguay" and is evidently taken from Pernetty's account (Journ. Voy. Malouïnes i. 306 (1769), under date 4 Jan. 1764), cited by Molina, of a Paraguay *Limonium* considered by Molina identical with his *Plegorhiza* — with the name "Guaicurú" by which, according to Schmitthenner (Phil. l. c), *Statice chilensis* is popularly known, there seem to be few points of likeness in the two plants. Molina's description of the flowers of his plant as "senza calice; corolla monopetala campaniforme intiera; stami nove brevissimi; . . . .stilo cortissimo" and his reference of it to the Enneandria Monogynia absolutely preclude the possibility of its identity with *Limonium*. It would seem that *Plegorhiza* should again take the place among the Genera Incertae Sedis which it held for a century after its publication.

[5] Medic. "Staatsw. Vorles. churpf. phys. ökon. Ges. i. 228 (1791)."

including type material of all the species recognized except *L. Endlichianum*, has been examined, and my best thanks are due the authorities of these institutions for the opportunity to study the collections under their charge. Through the kindness of Dr. Otto Stapf of the Kew Herbarium tracings and fragments of several types have been acquired for the Gray Herbarium. Unless otherwise noted, all specimens cited are in the Gray Herbarium.

Key to Species.

Calyx glabrous (rarely with one or two hairs in nos. 2 and 3).
  Branchlets loosely flowered; Atlantic coast species.
    Calyx-lobes deltoid or oval, obtuse or rounded, 0.5(–1) mm. long; innermost bractlet oval, usually minutely retuse at the obtuse to rounded apex, 3.6 mm. long.....1. *carolinianum*
    Calyx-lobes lance-ovate, acute, 0.7–1 mm. long; innermost bractlet broadly oblong, acute, 4.5 mm. long.....2. *angustatum*
  Branchlets densely flowered; Pacific coast species.....3. *mexicanum*
Calyx pubescent at least at base.
  Calyx-limb erect.
    Calyx (5.3) 6–7.5 mm. long, its lobes 1–1.7 mm. long.
      Calyx pubescent only at extreme base, or sometimes on one or two of the ribs to the middle; outermost bractlet ovate, acute to acuminate, 1.8–2 mm. long.
        Scape strongly branched from near the base, the branches flexuose-spreading; innermost bractlet broadly hyaline-margined, 5–6 mm. long.....4. *Endlichianum*.
        Scape branched from near the middle, the branches spreading-ascending; innermost bractlet rather narrowly hyaline-margined, 3.8–4.5 mm. long.....5. *Nashii*
      Calyx strongly pubescent to middle or beyond on all the ribs (rarely one or two of them only sparsely hairy); outermost bractlet oval, abruptly pointed, 2.5–3.5 mm. long.....6. *trichogonum*
    Calyx 4.3–5.5 mm. long, the lobes 0.4–0.8 mm. long.
      Calyx-lobes obtuse to subacute; hairs of calyx ca. 0.5–0.6 mm. long; branchlets loosely flowered; Atlantic coast species.
        7. *obtusilobum*
      Calyx-lobes acute or acutish; hairs of calyx ca. 0.2–0.3 mm. long; branchlets densely flowered; Pacific coast species.
        8. *californicum*
  Calyx limb wide-spreading.....9. *limbatum*

1. Limonium carolinianum (Walt.) Britton (as to syn. only). Scape slender, solid, 2–6 dm. high. Leaves lance-spatulate to oblong-obovate, obtuse or retuse at the often cuspidate apex, tapering into a petiole about equal to blade, the lamina 5.3–17.5 cm. long, 1–5.2 cm. wide. Panicle pyramidal, 14.5–30.5 cm. wide, the flowers loosely secund on the ultimate branchlets; spikelets 1–2-flowered. Outermost bractlet of spikelet elliptic-ovate, often mucronulate or apiculate at the acute or acutish apex, with green midrib and base, broadly hyaline-margined above, 1.5–2.2 mm. long; middle ovate, hyaline,

obtuse, with greenish midrib, 2.5 mm. long; innermost oval, mostly minutely retuse at the obtusish to rounded apex, with green center and base and broad hyaline margin, 3.6 mm. long. Calyx funnelform, glabrous, 4.5–5 (6.5) mm. long, the lobes deltoid or oval, obtuse or rounded, not mucronate, 0.5(–1) mm. long; intermediate teeth lanceolate to lance-oblong, obtuse, acutish, or retuse, about half as long. Petals apparently pale lavender. Fruit exceeding calyx. Plate 118, fig. A.

Statice ? caroliniana Walt.! Fl. Carol. 118 (1788), not of most auth.; Chapm. Fl. S. U. S. ed. 1. 278 (1860) & ed. 3. 300 (1897), ex char.

Statice Limonium L. var. *caroliniana* (Walt.) Gray, Man. ed. 2. 270 (1856), as to syn. only; Gray, Syn. Fl. ii. pt. 1. 54 (1878), as to syn. only.

Limonium carolinianum (Walt.) Britton, Mem. Torr. Club v. 255 (1894), as to syn. only; not of later auth.

Statice brasiliensis Gray, Syn. Fl. ii. pt. 1. 54 (1878), as to specim. and descr., not *S. brasiliensis* Boiss. in A. DC. Prod. xii. 644 (1848).

Limonium brasiliense Small, Bull. Torr. Club xxiv. 488 (1897), but not as to *Statice brasiliensis* Boiss., the name-bringing synonym, nor *L. brasiliense* (Boiss.) Ktze. Rev. i. 395 (1891); *Limonium brasiliensis* Heller, Cat. N. Am. Pl. ed. i. 6 (1898), but not as to *S. brasiliensis* Boiss., the name-bringing synonym.

North Carolina: Ocracoke, *M. A. Curtis.*

South Carolina: *Walter* (type in Brit. Mus.).

Florida: low black soil, near St. Petersburg, 19 Nov. 1907, *Mrs. C. C. Deam* 2943; Palm Key, 8 Dec. 1901, *Tracy* 7473 (distr. as *L. Nashii*); Cedar Keys, 1874, *Palmer* 332; without definite locality, *Ware.*

Mexico: Tamaulipas: field near Santa Teresa, Oct. 1830, *Berlandier* 3179 (in part).

There is also a panicle in Brit. Mus. (herb. Roemer) labelled "Statice nova species Carolina ita misit D. Decandolle qui in omnibus speciminibus folia deesse dicit." *Berlandier* 3179 is placed by Wangerin (l. c. p. 43) under *Statice Nashii*. Of the two specimens, of different dates (and perhaps confused), in the Gray Herbarium under that number one is *L. Nashii*, the other *L. carolinianum*. The latter differs from any others examined in its more densely flowered and rather stiffly erect branches and slightly less obtuse calyx-lobes, but it is somewhat approached in the former character by *Deam* 2943, and in the latter by *Palmer* 332. The calyx is also considerably larger (6.5 mm.) with larger teeth (1 mm.), having however the same shape. Further Mexican material may show its distinctness from *L. carolinianum*, but at present it does not seem advisable to distinguish it by a name.

2. Limonium angustatum (Gray) Small. Similar; leaves linear or linear-lanceolate to lanceolate, the blade 5.5–8.5 cm. long, 4.5–20.5 mm. wide, equalling or exceeding the petiole. Panicle 12.5–24

cm. wide, loosely flowered; spikelets apparently always 1-flowered. Outermost bractlet ovate, acute to acuminate, with hyaline margin, 2–2.5 mm. long; middle ovate, hyaline, with greenish midrib, acutely mucronate, 2.5–3 mm. long; innermost broadly oblong, acute, hyaline-margined, 4.5 mm. long. Calyx obconic, glabrous (rarely with one or two tiny hairs), 5.4–6.2 mm. long; lobes lance-ovate, acute, 0.7–1 mm. long; teeth bifid or entire, minute, about 0.2 mm. long. Otherwise as in *L. carolinianum*. PLATE 118, fig. B.

Statice caroliniana Boiss.! in A. DC. Prod. xii. 643 (1848), as to specim. in part, not Walt.

Statice brasiliensis Boiss. var. *angustata* Gray! Syn. Fl. ii. pt. 1. 54 (1878).

Limonium angustatum (Gray) Small, Bull. Torr. Club xxiv. 488 (1897).

Statice angustata (Small) Wangerin, Zeitsch. Naturw. Halle lxxxii. 439 (1911).

Statice brasiliensis Chapm. Fl. S. U. S. ed. 2. 634 (1883) & ed. 3. 300 (1897), ex char., not Boiss.

FLORIDA: salt marsh, Myers, Lee Co., July–Aug. 1900, *Hitchcock* 194; salt marsh, Pine Key, *Blodgett* (TYPE in Gray Herb.).

TEXAS: Galveston Bay, July 1847, *Lindheimer* (hb. Kew., fragm. in Gray Herb.); without definite locality, *Drummond* (hb. Kew., fragm. in Gray Herb.).

Although closely related to *L. carolinianum*, the present plant seems specifically distinct in characters of bractlets and calyx. *Hitchcock* 194 agrees in the latter features with the originals of Blodgett and must be referred to this species; its leaves however are much broader, and indicate that the narrow leaves by which the plant was first distinguished as a variety are an individual feature of no great importance. The specimens of Lindheimer and Drummond from Texas, cited by Boissier under *Statice caroliniana*, are certainly referable to the present species, and considerably extend the known range of the plant.

3. LIMONIUM **mexicanum** Blake, n. sp. Perenne erectum scaposum glabrum e radice subcylindrica ca. 13 cm. longa 0.8 cm. crassa. Scapus subvalidus vix bracteatus supra mediam partem paniculate ramosus. Folia oblonga vel oblongo-obovata vel obovata apice rotundata vel retusa interdum cuspidulata glabra coriacea crassiuscula venosa sensim in petiolum cuneate angustata, lamina 4.7–21 cm. longa 1.8–7.3 cm. lata in petiolis 2–9.5 cm. longis. Panicula pyramidalis 1.6–3.5 dm. lata, ramis divergenti-ascendentibus, ramulis ultimis dense floriferis spicas 1.3–2 cm. longas formantibus; spiculis saepissime 2-floris. Bractea extima orbicularis vel late orbiculari-ovata obtusa vel acuta breviter mucronata infra herbacea crassula punctata margine hyalino donata 1.5–2.5 mm. longa; mediae oblongo-ovatae obtusae hyalinae; intima elliptico-obovata apice apiculata late hyalino-marginata 3.6–4 mm. longa. Calyx anguste infundibuliformis glaberrimus (rare sparsissime pubescens) 5-costatus 4.6–5.2

mm. longus, limbo albido erecto 5-lobato, lobis deltoideo-ovalibus apiculato-acutatis 0.5–0.7 mm. longis, dentibus intermediis subnullis. Petala coerulea.

Erect glabrous perennial, scapose from a subcylindric root about 13 cm. long, 0.8 cm. thick. Scape stoutish, scarcely bracted, paniculately branched above the middle. Leaves oblong, oblong-obovate, or obovate, rounded or retuse at the sometimes cuspidulate apex, gradually narrowed into the petiole, glabrous, coriaceous, thickish, veiny, the blade 4.7–21 cm. long, 1.8–7.3 cm. wide, on petioles 2–9.5 cm. long. Panicle pyramidal, 1.6–3.5 dm. wide, the branches divergent-ascending, the ultimate branchlets densely flowered, forming spikes 1.3–2 cm. long; spikelets nearly always 2-flowered. Outermost bractlet orbicular or broadly orbicular-ovate, obtuse to acute, short-mucronate, with thickish punctate herbaceous body and hyaline margin, 1.5–2.5 mm. long; middle ones oblong-ovate, obtuse, hyaline; innermost elliptic-obovate, apiculate, broadly hyaline-margined, 3.6–4 mm. long. Calyx narrowly infundibuliform, glabrous (rarely with a few hairs), 5-ribbed, 4.6–5.2 mm. long, the whitish limb erect, 5-lobed; the lobes deltoid-oval, apiculate-acute, 0.5–0.7 mm. long; intermediate teeth obsolescent. Petals bluish. Plate 118, fig. C.

Limonium californicum Small, Bull. Torr. Club xxv. 318 (1898), and Fl. S. E. U. S. 900 (1903), ex char., not *Statice californica* Boiss.

California: San Diego, 1876, *Palmer* 216 (types in Gray Herb. and Brit. Mus.); Ocean Beach, near San Diego, 17 Aug. 1894, *Mearns* 4036.

Lower California: Playa Maria, July–Oct. 1896, *Anthony* 117.

Anthony's collection of this species is of especial interest as affording the first West-Mexican collection of the genus. *Mearns* 4036 deviates slightly from the other collections in that some of the calyces bear a very few short hairs near the middle, but, as in the case of similar specimens of *L. angustatum*, the essentially glabrous character of the calyx is easily recognized and there is no danger of confusion with the species with strongly pubescent calyx (nos. 4–9).

4. Limonium **Endlichianum** (Wangerin) Blake, n. comb. Glabrous. Leaves oblong, coriaceous, 8.5 cm. long, 2.5 cm. wide; petioles 5.5 cm. long. Scape 3.5 dm. high, strongly branched nearly from base, the primary branches flexuose-spreading, several times dichotomous, the secondary curved-ascending, partly sterile, the flowering branchlets very loose, slightly elongate, recurved, the spikelets 2-flowered, loose or somewhat approximate, the whole forming a very broad loose broom-like panicle. Outermost bractlet ovate, acute or shortly mucronulate, narrowly membranaceous-margined, 2 mm. long; middle hyaline, nearly 4 mm. long; inmost obtuse, usually incised at apex, broadly hyaline-margined, 5–6 mm. long. Calyx 7 mm. long, long-obconic, pilose at base along the two inner ribs; lobes lance-triangular, acute, 1.5 mm. long, three times as long as the intermediate teeth. Corolla bluish.

Statice Endlichiana Wangerin, Zeitsch. Naturw. Halle lxxxii. 441 (1911).

Mexico: Tamaulipas: Rincón del Toro, on the exsiccated maritime creek Laguna Madre, June 1904, *R. Endlich* 549 (type in Herb. Berol.).

Not seen; description translated from Wangerin's original diagnosis. The species seems doubtfully distinct from *L. Nashii*.

5. Limonium Nashii Small. Plant 2.7–8.4 dm. high, the scape solid. Leaves oblong or oblong-spatulate to obovate, obtuse or rounded or retuse at the barely mucronulate apex, narrowed into the petiole, the lamina 5–17 cm. long, 1.7–4.5 cm. wide, on petioles 4.5–16.5 cm. long. Scape paniculately much branched from near the middle, the panicle 1.8–3 dm. wide, the branches spreading-ascending, the ultimate branchlets loosely flowered; spikelets 1–2(usually 1)-flowered. Outermost bractlet ovate, acute to acuminate, mucronate, hyaline-margined, 1.8–2 mm. long; middle oblong, erose at the obtuse apex, hyaline with distinct midrib, 2.5–4 mm. long; innermost elliptic, rounded or retuse, hyaline-margined, 3.8–4.5 mm. long. Calyx obconic, sparsely or rather densely short-pilose at extreme base and often on one or two of the ribs for about $\frac{1}{3}$–$\frac{1}{2}$ their length, 6.2–6.8 mm. long; limb erect, whitish, 5-lobed; lobes lanceolate-ovate, acuminate, 1–1.5 mm. long; teeth very short and bifid or obsolescent. Petals violet. Plate 118, fig. D.

Statice Limonium L. var. *carolinianum* Gray! Syn. Fl. ii. pt. 1. 54 (1878), in part, not *S. caroliniana* Walt.

Limonium Nashii Small! Bull. Torr. Club xxiv. 491 (1897); Harper, Bull. Torr. Club xxviii. 478 (1901) (Tybee Island, Georgia, *Harper* 748).

Statice Nashii (Small) Wangerin, Zeitschr. Naturw. Halle lxxxii. 440 (1911).

South Carolina: Morris Island, 1864, *Dr. Grosvenor*.

Florida: Titusville, Brevard Co., 30 July–1 Aug. 1895, *Nash* 2305 (cotype coll.).

Texas: Galveston Island, 23 Sept. 1901, *Tracy* 7474 (distr. as *L. californicum*); Galveston Bay, July 1842, *Lindheimer*.

Mexico: Tamaulipas: maritime fields, May 1843, *Berlandier* 3179 (in part).

Tracy 6475, from St. Vincent, Florida, 4 Sept. 1899, is very puzzling, having the bractlets of *L. carolinianum*, a calyx 6.5 mm. long, pubescent at extreme base and on two of the ribs to middle or nearly so, and ovate merely acute calyx-lobes about 0.7 mm. long. It may be a hybrid of *L. carolinianum* and *L. Nashii*.

6. Limonium **trichogonum** Blake, n. sp. Perenne pluriscaposum erectum 2–6 dm. altum et ultra. Folia obovata vel obovato-spathulata acuta vel obtusa valde cuspidata basi in petiolum cuneate angustata glabra penninervia, lamina 4–12.5 cm. longa, 1.2–4.8 cm. lata, in petiolis 3–15 cm. longis. Scapus fistulosus e medio paniculate ramosus; panicula plus minusve pyramidalis 1–3 dm. lata, ramis

adscendenti-patentibus laxifloris rectis vel paullum recurvis, spiculis 1–2-floris. Bractea extima suborbiculari-ovata vel ovalis valde mucronata hyalino-marginata 2.5–3.5 mm. longa; mediae oblongo-ovatae obtusae hyalinae; intima oblongo-ovalis obtusa vel rotundata irregulariter erosa late hyalino-marginata 4–5.5 mm. longa. Calyx cylindrico-obconicus costis 5 e basi ad mediam partem et supra valde pilosis (5.3) 6–7.5 mm. longus, limbo albido pallide lavendulaceo-tincto, lobis ovato-lanceolatis acuminatis 1.5–1.7 mm. longis, dentibus intermediis triangularibus saepius bifidis ad 0.3 mm. longis. Petala lavendulacea.

Erect perennial, several-scaped, 2–6 dm. high and more. Leaves obovate or obovate-spatulate, acute to obtuse, strongly cuspidate, cuneately narrowed into the petiole, glabrous, penninerved, the blade 4–12.5 cm. long, 1.2–4.8 cm. wide, on petioles 3–15 cm. long. Scape fistulose, paniculately branched from the middle; panicle more or less pyramidal, 1–3 dm. broad, the branches ascending-spreading, loosely flowered, straight or slightly recurved; spikelets 1–2-flowered. Outermost bractlet suborbicular-ovate to oval, strongly mucronate, hyaline-margined, 2.5–3.5 mm. long; inner oblong-ovate, obtuse, hyaline; innermost oblong-oval, obtuse or rounded, irregularly erose, broadly hyaline-margined, 4–5.5 mm. long. Calyx cylindric-obconic, the five ribs strongly pilose to above the middle, (5.3) 6–7.5 mm. long, the limb palely lavender-tinged; lobes ovate-lanceolate, acuminate, 1.5–1.7 mm. long; intermediate teeth triangular, usually bifid, about 0.3 mm. long. Petals lavender. Plate 119, fig. E.

Statice Limonium Bigelow, Fl. Bost. ed. 1. 75 (1814), and other early Amer. auth., not L.

Statice caroliniana Pursh, Fl. i. 212 (1814), not Walt.; Bigelow, Am. Med. Bot. ii. 51. t. 25 (1818), and auth., not Walt.; Boiss! in A. DC. Prod. xii. 643 (1848), as to descr., and specim. in part, not Walt.

Statice Limonium L. var. *carolinianum* (Walt.) Gray! Man. ed. 2. 270 (1856) and auth., excl. name-bringing syn.

Limonium carolinianum (Walt.) Britton, Mem. Torr. Club v. 255 (1894), and later auth., not *Statice caroliniana* Walt.; Britton & Brown, Ill. Fl. ed. 2. ii. 718 (1913), not *Statice caroliniana* Walt., and excl. Bermudan range.

Newfoundland to New Jersey, and probably further southward. Among the numerous specimens examined, the following may be cited:

Newfoundland: *Miss Brenton* (hb. Kew., fragment in Gray Herb.).

Labrador: southern part, *Storer* ("passing to *bahusiensis*," Gray in sched.).

New Brunswick: brackish sands, Neguac Island, 16 Sept. 1913, *Blake* 5666; brackish marsh along Black River, Loggieville, 5 Sept. 1913, *Blake* 5624 (type in Gray Herb.).

Prince Edwards Island: Bunbury, 28 Aug. 1912, *Fernald, Long & St. John* 7931; Mt. Stewart, 30 July 1912, *Fernald, Bartram, Long & St. John* 7930.

QUEBEC: Anse à Persil, Rivière du Loup, July 1913, *Bro. Victorin* 53.
NEW ENGLAND: common on the coast.
NEW YORK: Hawthorne Beach, Port Chester, 28 Aug. 1888, *L. M. Stabler.*
NEW JERSEY: Point Pleasant, Ocean Co., 8 Aug. 1908, *Bartram;* Atlantic City, 1884, *L. F. Ward.*

The commonest and most widespread of our species, and the only one found on the Atlantic coast north of North Carolina, so far as yet known. This beautiful species, well distinguished by its strongly pilose calyx with acuminate teeth 1.5–1.7 mm. long, has passed for more than a century as *Statice caroliniana* Walt., but the type of that species belongs to a very different species with glabrous calyx (see no. 1). Occasionally the hairs on one or two of the ribs are sparse, but even in such extreme cases a few may generally be found reaching to the middle of the tube or beyond. At least three of the ribs seem to be always strongly haired, and no sign of intergradation with the southern *L. Nashii* has yet been seen. A puzzling specimen from Virginia (*Clayton* 573, Brit. Mus.) has the calyx-teeth and other features of *L. trichogonum*, but the absolutely glabrous tube of *L. carolinianum*, and may be of hybrid origin.

7. LIMONIUM **obtusilobum** Blake, n. sp. Perenne scaposum erectum 2.9 dm. altum. Scapus tenuis supra subsimpliciter ramosus. Folia anguste lanceolato-spathulata acuta mucronata basi in petiolum angustata coriacea glabra vix venosa, lamina 3.5–4.5 cm. longa 4.5–6 mm. lata, in petiolis 3–4.5 cm. longis. Panicula subpyramidalis 1.2 dm. lata, ramis adscendentibus ramulis ultimis sublaxifloris rectis vel recurvatis spicas 1–2.2 cm. longas gerentibus; spiculis 1–(saepius)2-floris. Bractea extima ovata vel orbiculari-ovata obtusa vel subacuta non mucronata hyalino-marginata 1 mm. longa; mediae hyalinae ovales obtusae; intima elliptica apice rotundata non mucronata hyalino-marginata 2.5 mm. longa. Calyx obconicus 4.3–4.7 mm. longus costas 5 secundum ad mediam partem plus minusve dense pilosus pilis 0.5–0.6 mm. longis, lobis 5 deltoideo-ovatis obtusis ad subacutis 0.4 mm. longis, dentibus intermediis subovalibus integris 0.1–0.2 mm. longis. Petala pallida.

Scapose erect perennial, 2.9 dm. high. Scape slender, subsimply branched above. Leaves narrowly lance-spatulate, acute, mucronate, narrowed into the petiole, coriaceous, glabrous, scarcely venose, the blade 3.5–4.5 cm. long, 4.5–6 mm. wide, on petioles 3–4.5 cm. long. Panicle subpyramidal, 1.2 dm. wide, the branches ascending, the ultimate branchlets rather loosely flowered, straight or recurved, bearing spikes 1–2.2 cm. long; spikelets 1–(usually)2-flowered. Outermost bractlet ovate or orbicular-ovate, obtuse or subacute, not mucronate, hyaline-margined, 1 mm. long; middle hyaline, oval, obtuse; innermost elliptic, rounded at apex, not mucronate, hyaline-margined, 2.5 mm. long. Calyx obconic, 4.3–4.7 mm. long, more or less densely pilose on ribs to the middle with hairs 0.5–0.6 mm. long;

lobes 5, deltoid-ovate, obtuse to subacute, 0.4 mm. long; intermediate teeth suboval, entire, 0.1–0.2 mm. long. Petals pale. Plate 119, fig. F.

Florida: without further data, *Chapman* (type in Gray Herb.).

This new species, known only from a single specimen, is very distinct among eastern species in its combination of pilose calyx with short obtusish calyx-lobes. Were it not for its minute flowering bractlets, much smaller than any seen in *L. carolinianum*, it might perhaps be considered a hybrid of that species with *L. Nashii*. Further specimens are much to be desired to determine the exact habitat of the species and to test its status.

8. Limonium californicum (Boiss.) Heller. Plant 2–4 dm. high and more. Leaves obovate or oblong-obovate, obtuse or rounded to retuse at the barely mucronulate apex, narrowed into the petiole, coriaceous, veiny, fleshy, the blade 4.5–16.5 cm. long, 1.5–5.5 cm. wide, on petioles 2–10 cm. long. Scape stoutish, solid, paniculately much branched usually from below the middle to apex. Panicle 3.5–35 cm. wide, subpyramidal, the branches strongly ascending, densely flowered at their apices, forming spikes 1–3.7 cm. long; spikelets 1–2-flowered, distichously arranged. Outermost bractlet elliptic, obtuse to acute, mucronate or apiculate, hyaline-margined, 2–2.5 mm. long; middle hyaline, with strong green midrib, subacute, 3.3 mm. long; innermost elliptic, obtusish to acutish, rarely subapiculate, hyaline-margined, 4 mm. long. Calyx obconic, 4.5–5.5 mm. long, the ribs pubescent to above the middle with short hairs ca. 0.2–0.3 mm. long; lobes deltoid-ovate, acute or acutish, 0.5–0.7 mm. long; intermediate teeth obsolescent or absent. Plate 119, fig. G.

Statice californica Boiss.! in A. DC. Prod. xii. 643 (1848).

Statice Limonium L. var. *californicum* (Boiss.) Gray! in Brewer & Watson, Bot. Calif. i. 466 (1876); Syn. Fl. ii. pt. 1. 54 (1878), in part.

Limonium commune S. F. Gray var. *californicum* (Boiss.) Greene, Man. San Francisco Bay Reg. 235 (1894).

Limonium californicum (Boiss.) Heller, Cat. N. Am. Pl. ed. 1. 6 (Mar. 1898); Small, Bull. Torr. Club xxv. 318 (June 1898), as to name-bringing syn. only; Small, Fl. S. E. U. S. 900 (1903), as to name only.

Statice Limonium Rattan! Calif. Fl. 72 (1879), not L.

California: salt marshes, Humboldt Bay, June 1878, *Rattan*; West Berkeley, June 1891, *Michener & Bioletti* 193; Oakland, 7 July 1881, *Jones* 2367 (Brit. Mus.); salt marshes, Oakland, 11 Aug. 1891, *Blankinship:* salt marshes, San Francisco, Oct. 1837, *Barclay* 1577 (cotype coll.: Brit. Mus.); marshes, Palo Alto, 30 Aug. 1902, *C. F. Baker* 1516; Santa Clara, *Sinclair* (cotype coll.: hb. Kew., tracing and fragm. hb. Gray); salt marshes, Wilmington, Oct. 1882, *Parish Bros.* 959; margins of bay, San Pedro, 6 Sept. 1904, *Abrams* 4184; without definite locality, 1846, *Frémont*.

9. Limonium limbatum Small. Plant 5 dm. high and more,

glaucescent. Leaves obovate, rounded or retuse at the barely mucronulate apex, narrowed into the petiole, thick, leathery, venose, the blade 6–14 cm. long, 2.4–4.5 cm. wide, on petioles 5.5–10 cm. long. Scape stout, much branched from below the middle upwardly. Panicle large, 2.3–3 dm. wide and more, the branches divergent-ascending, the 2-flowered spikelets densely and distichously aggregated in 0.8–1.4 cm. long spikes on the ultimate branchlets. Outermost bractlet ovate-orbicular or orbicular, acute or acutish, mucronate or apiculate, hyaline-margined, 1–1.4 mm. long; middle oblong-oval, retuse at apex, hyaline with green midrib, 3 mm. long; innermost very firm, elliptic, rounded or retuse at apex, hyaline-margined, 3–3.5 mm. long. Calyx trumpet-shaped with wide-spreading limb, ca. 3.7 mm. long, two or three of the ribs pubescent to middle, the others generally only at extreme base or not at all; lobes deltoid-ovate, obtuse to acute, ca. 0.7 mm. long; intermediate teeth depressed-deltoid, about 0.2 mm. long, or obsolescent. "Corollas light blue." PLATE 119, fig. H.

Statice californica Torr.! in Sitgreaves' Rep. 167 (1853), not Boiss.

Statice Limonium L. var. *californicum* Gray! Syn. Fl. ii. pt. 1. 54 (1878), in part, not *S. californica* Boiss.

Limonium limbatum Small! Bull. Torr. Club xxv. 317 (1898).

Statice limbata (Small) K. Sch. in Just's Jahresber. xxvi. pt. 1. 390 (1900); Wangerin, Zeitschr. Naturw. Halle lxxxii. 441 (1911).

TEXAS: salt flats near Pecos City, 5–6 July 1900, *Eggert*.

NEW MEXICO: plains west of White Mts., Lincoln Co., alt. 1250 m., 19 July 1897, *Wooton* 172 (COTYPE COLL.); Zuni Mts., 1851, *Woodhouse* (COTYPE COLL.); near Escondido Creek, June 1851, *Wright* 1435 (COTYPE COLL.); Roswell, Chaves Co., alt. 1158 m., Aug. 1900, *Earle* 341 (Brit. Mus.).

The most distinct of all our species by reason of its flaring calyx-limb and very densely aggregated spikelets with strongly thickened bractlets.

EXPLANATION OF PLATES 118 AND 119.

PLATE 118. Fig. A. *Limonium carolinianum* (Walt.) Britton. 1, flowering branchlet, × 1¼; 2, fruiting calyx, × 9; 3, outermost bractlet of spikelet, × 9; 4, innermost bractlet of spikelet, × 9. Drawn from *Tracy* 7473.

Fig. B. *L. angustatum* (Gray) Small. 1, flowering branchlet, × $\frac{9}{10}$; 2, fruiting calyx, × 9; 3, outermost bractlet, × 9; 4, innermost bractlet, × 9; 5, lobe and tooth of fruiting calyx, × 18. Drawn from type (*Blodgett*).

Fig. C. *L. mexicanum* Blake. 1, spike, × 2; 2, fruiting calyx, × 9; 3, outermost bractlet, × 9; 4, innermost bractlet, × 9; 5, lobe of fruiting calyx, × 18. Drawn from type (*Palmer* 216).

Fig. D. *L. Nashii* Small. 1, portion of flowering branchlet, × 1½; 2, fruiting calyx, × 9; 3, outermost bractlet, × 9; 4, innermost bractlet, × 9. Drawn from cotype collection (*Nash* 2305).

Plate 119. Fig. E. *L. trichogonum* Blake. 1, portion of flowering branchlet, × 1¼; 2, fruiting calyx, × 9; 3, outermost bractlet, × 9; 4, innermost bractlet, × 9. Drawn from type (*Blake* 5624).

Fig. F. *L. obtusilobum* Blake. 1, flowering branchlet, × 2; 2, fruiting calyx, ×9; 3, outermost bractlet, × 9; 4, innermost bractlet, × 9. Drawn from type (*Chapman*).

Fig. G. *L. californicum* (Boiss.) Heller. 1, spike, × 2; 2, fruiting calyx, × 9; 3, outermost bractlet, × 9; 4, innermost bractlet, × 9. Drawn from fragments of cotype (*Sinclair*) in Gray Herb., except fig. 1 which is from *Baker* 1516.

Fig. H. *L. limbatum* Small. 1, spike, × 1½; 2, fruiting calyx, × 9; 3, outermost bractlet, × 9; 4, innermost bractlet, × 9. Drawn from cotype collection (*Wooton* 172).

DISCOVERY OF PRUNUS CUNEATA IN SOUTHERN NEW JERSEY.

Bayard Long.

Dr. Witmer Stone's *The Plants of Southern New Jersey* [1] bears a significant subtitle which must not be overlooked — *with Especial Reference to the Flora of the Pine Barrens.* His work was originally intended as a study of the Pine Barrens alone but upon the persuasion of the authorities of the New Jersey State Museum it was later enlarged to include the whole of southern New Jersey.

Of the life-areas of the southern part of the state, it is to be recalled that there may be recognized, besides the *Pine Barrens* and a *Maritime* region, the *Middle District* of West Jersey and the recently discovered *Coast Strip* [2] on the eastern edge of the Pine Barrens. (The *Cape May District* of Stone is really a complex of all the other areas.) It was well recognized at the time of publication that the original work done upon the Middle District and the Coast Strip was incomparably meager to that done upon the Pine Barrens. Many more species, it was felt, would be added in time to the Middle District flora, while the Coast Strip had been so slightly touched and so little systematized work done upon it, throughout its length, that its exploration was really only

[1] Ann. Rep. N. J. State Mus. 1910, 23–828 (1912).

[2] See Stone, Proc. Acad. Nat. Sci. Phila. 1907, 452 (1908) and Bartonia, i. 20 (1909).

begun. Much time had been spent upon the Pine Barrens, however, and it was hoped that its plant life had been worked out with a fair degree of completeness. Though a number of species, having a general distribution in the Middle District, have been shown to have an occurrence, or a wider distribution, in the Pine Barrens than was originally supposed, this hope has been in large measure realized. In fact no species of any particular significance, so far as I am aware, has been added to the Pine Barren flora until during the past summer. The discovery in the "Pines" of an apparently indigenous species, heretofore unknown in southern New Jersey, is therefore of some interest to at least the local botany of the region.

On July 10, 1915, on the middle eastern edge of the Pine Barrens, I was hurrying over the supposedly quite uniform dry pine woods in order to spend the time more advantageously at interlying bogs and streams, between two obscure flag-stations on the Tuckerton Railroad called Waretown Junction and Lacy. I had been seeing so frequently the low bushes of Black Chokeberry, *Aronia melanocarpa*, in immature fruit, that my casual glance had almost passed some similar little shrubs, when their dark fruit and pale foliage stirred a recollection of sand-plain New England, and I found myself standing on the edge of a colony of *Prunus cuneata*, in abundant ripe and green fruit.

The locality is southeast of Lacy on the North Branch of Forked River where it crosses the Tuckerton Railroad. At the summit of the deep railroad cut through the rise of ground immediately southeast of the Branch it appears to be most abundant, thriving in the regulation dry, sandy, scrubby growth of the Pine Barrens, among Sweet Fern, Black Huckleberry, Low Blueberry, Scrub Oaks, etc. Some of the plants are on the very edge of the cut with the long, stocky roots exposed in the sliding yellow gravel, but most of them are some distance back in the thin, open scrub-growth.

This general region is rather subject to forest fires and the railroad right-of-way is kept well cleared. Much of the shrubbery has suffered from the scythe and the low habit of some of the *Prunus* plants appears to be due to this chance pruning. Further northwest, on the gravel fill connecting the bridge over the North Branch, the plant is again frequent. It is here much taller and more luxuriant, becoming a foot or more in height with tall rank shoots of the year and large leaves.

This fact of the plant being frequent on the transported soil of the gravel fill does not argue its introduction into southern New Jersey by the railroad, it appears to me, but represents only another example of the very common occurrence of native plants which are carried along with transported soil, and find the loose, well-drained, semi-cleared gravel embankments of the railroads a very favorable place for luxuriant growth. In this present case of very local introduction, the gravel used in building this fill, I think, without much need of question, came from the nearby cut. Although the fill stands upon a cleared cedar swamp bordering the stream, its slopes bear a vigorous growth of numerous dry ground native species: *Andropogon scoparium, Aronia melanocarpa, Neopieris mariana, Vaccinium vacillans, Aster spectabilis, Aster gracilis* — all of which could without doubt be found in natural habitats in the immediate neighborhood. With this association of species occurs *Prunus cuneata* on the fill. I think there need be no hesitation in believing that it was derived from the colony at the summit of the nearby slope.

Native species which are commonly recognized as weeds, or are well known as likely of introduction; species in cultivation or wild species whose fruits are collected and shipped to the market — these, and plants of numerous other categories, are always open to suspicion when they are credited as being native in a botanically well known region where previously unrecorded. The common occurrence of peaches, pears, apples in natural habitats in New Jersey offers no problem to the field botanist, but the presence of certain species of blackberries, strawberries, or blueberries along railroads in districts where small fruits are grown or collected is to be looked upon as a very different case.

As regards the possibility of introduction of *Prunus cuneata*, however, the chances seem rather slight: —

It is a plant of somewhat restricted distribution, commonly recorded from habitats which bear little or no close relation to lands subject to cultivation. I have found no published records of the species ever occurring as an introduction, and with the exception of a locality brought to my attention in conversation with Mr. K. K. Mackenzie, it appears to be known from only wild and undisturbed areas. In a recent letter Mr. Mackenzie describes this occurrence of *Prunus cuneata* as "a few bushes, possibly six, near a place called Wortendyke, north of Paterson, New Jersey. These bushes were at the edge of a

plowed field — between the edge of the field and the fence. The soil was rather sandy and in the immediate vicinity was a good deal of scrub oak with small openings between. I, however, found no other specimens of *Prunus*. Hence I have often doubted whether it was native in this particular locality." But, as he says further on, in general comment, "whether *Prunus cuneata* is native or not at any particular location would have to be decided by a consideration of all factors involved," and no doubt arguments could be advanced on the possibility of this being a really indigenous colony.— The species is not known in the immediate vicinity of this new locality at Lacy, while the nearest well known stations are along the coast of Connecticut, the Highlands of the Hudson, the summits or upper slopes of the Kittatinny Mountains of northern New Jersey and eastern Pennsylvania, and very locally in Lancaster County, Pennsylvania — a distance averaging nearly a hundred miles. Distance always removes certain possibilities of chance introduction, but on the other hand a distance of a hundred miles is not at all to be construed as too far removed for the outposts of a natural distribution. There are too many well known cases of even greater distances between outlying stations to require specific comment.— The fruit is scarcely palatable and does not seem to be collected. L. H. Bailey says: "Not in the trade, so far as known." [1] and W. F. Wight in his comprehensive treatment of *Native American Species of Prunus* states: "It has apparently not been utilized in horticulture." [2]

The above facts seem to remove at least some of the more readily possible sources of introduction.

The most interesting evidence, it would seem, of the likelihood of the plant being indigenous on the Coastal Plain of New Jersey is furnished by its well known occurrence in the sand-plain region of New England. Until the summer of 1913 I had been familiar with the species only on rocky slopes and summits of the Poconos and Kittatinnies. When botanizing with Prof. M. L. Fernald in eastern Massachusetts, in the town of Lakeville, August 26, 1913, the occurrence of *Prunus cuneata* in the flat, sandy region of Plymouth County was greeted by me with some surprise, but I was assured that this was not an unusual species of this area. Several days later the plant was seen again in Plymouth County in a habitat very similar, as I recall it

[1] Bailey, Cycl. Am. Hort. 1451 (1901).
[2] Wight, U. S. Dept. Agr. Bull. No. 179. 67 (1915).

now, to that at Lacy, New Jersey — a dry,[1] open, sandy, undulating slope, bearing scattered, scrubby thickets, backed by low trees, and descending into a bog along a streamlet.

Prof. Fernald writes me that "in New England the species is emphatically one of the coastal sands and sterile rocky barrens, and we should not expect to see it elsewhere. All of our material comes from the southern tier of states or from the sand-plain areas of the interior extending inland and northward to the sands about Lake Champlain, the sandy shores (along with *Hudsonia*, *Polygonella* &c.) of the Winnepesaukee and Ossipee region and the sandy plains of southwestern Maine, as well as the sand-plain of the Housatonic and Connecticut valleys."

Dr. N. L. Britton, in two papers on the flora of the Kittatinny Mountains, in calling attention to the existence there of sand-plain types, many years ago recognized this species as a sand-loving plant, and although at that time supposing it to be conspecific with *Prunus pumila*, which is "more commonly found on sandy river shores, though not a coastal plant," [2] he nevertheless associated it, and quite correctly, as a further knowledge of our Coastal Plain flora has shown, with "plants whose ordinary habitat is in sandy soil near the Atlantic Coast." [2]

That this little Sand Cherry is frequent in the sand-plain areas of New England and very rare in southern New Jersey may possibly be a case parallel in some measure to the abundance of such species as *Sabatia dodecandra*, *Corcopsis rosea*, *Chrysopsis falcata* in the New England areas having a Coastal Plain flora, and their comparative infrequence in south Jersey! — not a case of plants of similar distribution but plants which are definitely sand-loving and might be supposed to occur in increased abundance in the extensive sands of the Coastal Plain.

Academy of Natural Sciences of Philadelphia.

[1] The rather frequent insistence, in manuals and floras, of a moist rather than a dryish habitat is perhaps worthy of comment. This may be correct, without doubt, for some portions of the range, possibly to the northwestward. But, though there is sometimes "sandy," "rocky," "or among rocks" included, frequently the habitat noted does not very satisfactorily describe the usually dry, sandy, sterile or rocky situation in which the plant commonly occurs in the east. In the volumes used in daily reference we find the species recorded from "moist, sometimes rocky soil or meadows," "wet soil," "bogs and other cool land," "near lakes and about bogs or other moist situations."

[2] Britton, Bull. Torr. Bot. Cl. xiv. 187 (1887).

Meetings of the Vermont Botanical Club.— The twenty-first annual field meeting of the Vermont Botanical Club was held at St. Johnsbury, July 6–10, 1915, in conjunction with the Vermont Bird Club. The weather was fine with the exception of one day and trips were made to Danville, Barton which lies at the junction of the Connecticut and Passumpsic Rivers, Lunenburg and some rich woods on the outskirts of the village.

Near Danville a fine station for the ragged robin, *Lychnis Flos-cuculi*, was found. The small toadflax, *Linaria minor*, was growing along the railroad at Danville station. Not far from here two wooded swamps were visited. In one nothing of special interest was observed, but the other had quite an abundance of that rare orchid, *Calypso borealis*. This unfortunately was past its blooming season, but the twayblade, *Listera convallarioides*, and the rein orchis, *Habenaria obtusata*, were just in their prime and in abundance. The showy and yellow lady's slippers, *Cypripedium hirsutum* and *C. parviflorum*, var. *pubescens*, were also growing there with many other plants of interest.

Two swamps between Danville and St. Johnsbury which were explored had plenty of the *Habenaria obtusata* but no *Listera*. The one-flowered pyrola, *Moneses uniflora* grew here in the greatest profusion however and the twin-flower, *Linnaea borealis* var. *americana* rioted over everything on the ground.

At Barton the specially interesting plants were the false asphodel, *Tofieldia glutinosa*, and the rein orchis, *Habenaria flava*, on the wet shore of the Connecticut, the horned pondweed, *Zannichellia palustris*, var. *pedunculata*, in a small pool in the rock ten or twelve feet above the surface of the water at the junction of the two rivers and the bearberry, *Arctostaphylos Uva-ursi*, on the high ground back of the river.

At Lunenburgh it was too wet after the storm of the day before to climb the mountain to see the station for the goldenrod, *Solidago Cutleri*, and nothing of special interest was seen.

The twenty-first annual winter meeting of the Vermont Botanical Club was held at Rutland, January 21 and 22nd, 1916, in conjunction with the Vermont Bird Club. Twelve botanical papers were read and discussed. The more important were: "Notes on my Trip to California," by Dr. Ezra Brainerd of Middlebury; "A Study of Light in Forests," by Prof. George P. Burns of the University of Vermont, Burlington; "Germination of Pollen of hybrid Blackberries," by A. K. Peitersen, University of Vermont; and "Additions and Corrections to the Vermont Flora," by W. W. Eggleston, of Washington.

A very interesting lecture was given Friday evening by Prof. George P. Burns on "The Use of native Trees and Shrubs in Landscape Design," a paper well illustrated by a series of excellent lantern-slides.

The two Clubs have now practically united, and the officers of both are as follows: President, Dr. Ezra Brainerd of Middlebury; Vice-

President, Dr. H. F. Perkins, University of Vermont, Burlington; Secretary, Prof. G. P. Burns, University of Vermont; Treasurer, Mrs. Nellie F. Flynn, Burlington; Editors: G. L. Kirk, Rutland, and Prof. A. E. Lambert, Middlebury; Librarian, Miss Phoebe M. Towle, Burlington.

The summer meeting of 1916 will be held at Wallingford, probably in the early part of July.— Nellie F. Flynn, Burlington, Vermont.

Chelone glabra L., forma **rosea**, n. f., corolla rosea fauce purpurea.

Corolla rose-color, with purple throat.— New Hampshire: borders of wet woods near The Flume, Lincoln, September 1, 1915, *Fernald*, no. 11,871 (type in Gray Herb.).

A very handsome form, in color suggesting the more southern *C. obliqua* L. and *C. Lyoni* Pursh, but with the entire bracts of *C. glabra*, in which the corolla is ordinarily white or whitish with a pearly-pink or roseate throat.— M. L. Fernald.

Rynchospora macrostachya within the Boston District.— In looking over past numbers of Rhodora recently, I noticed the absence from the "Flora of the Boston District" of a sedge that is locally abundant at North Easton and I think that a report of it may be of interest to some of the readers. On September 13, 1915, I collected specimens of *Rynchospora macrostachya* Torr. growing abundantly about a pond in North Easton, Massachusetts. All gradations of this species and its variety *inundata* (Oakes) Fernald seemed to thrive along one shore of this particular pond. This station appears to have been unrecorded, although there are recorded stations slightly to the northeast, at Great Pond, South Weymouth and at Great Pond, Braintree (see Blake, Rhodora, xv. 19).— Charles Schweinfurth, North Easton, Massachusetts.

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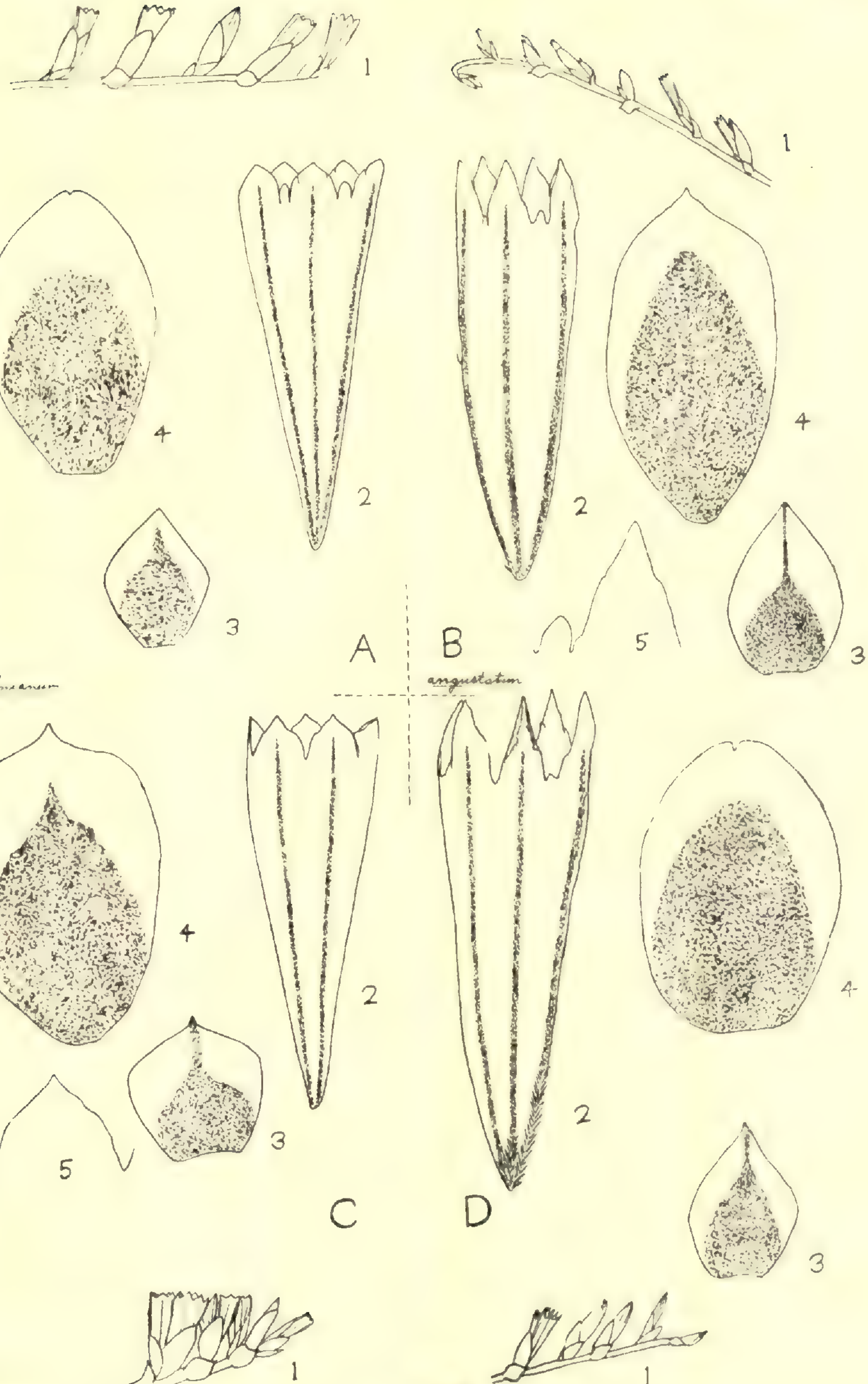
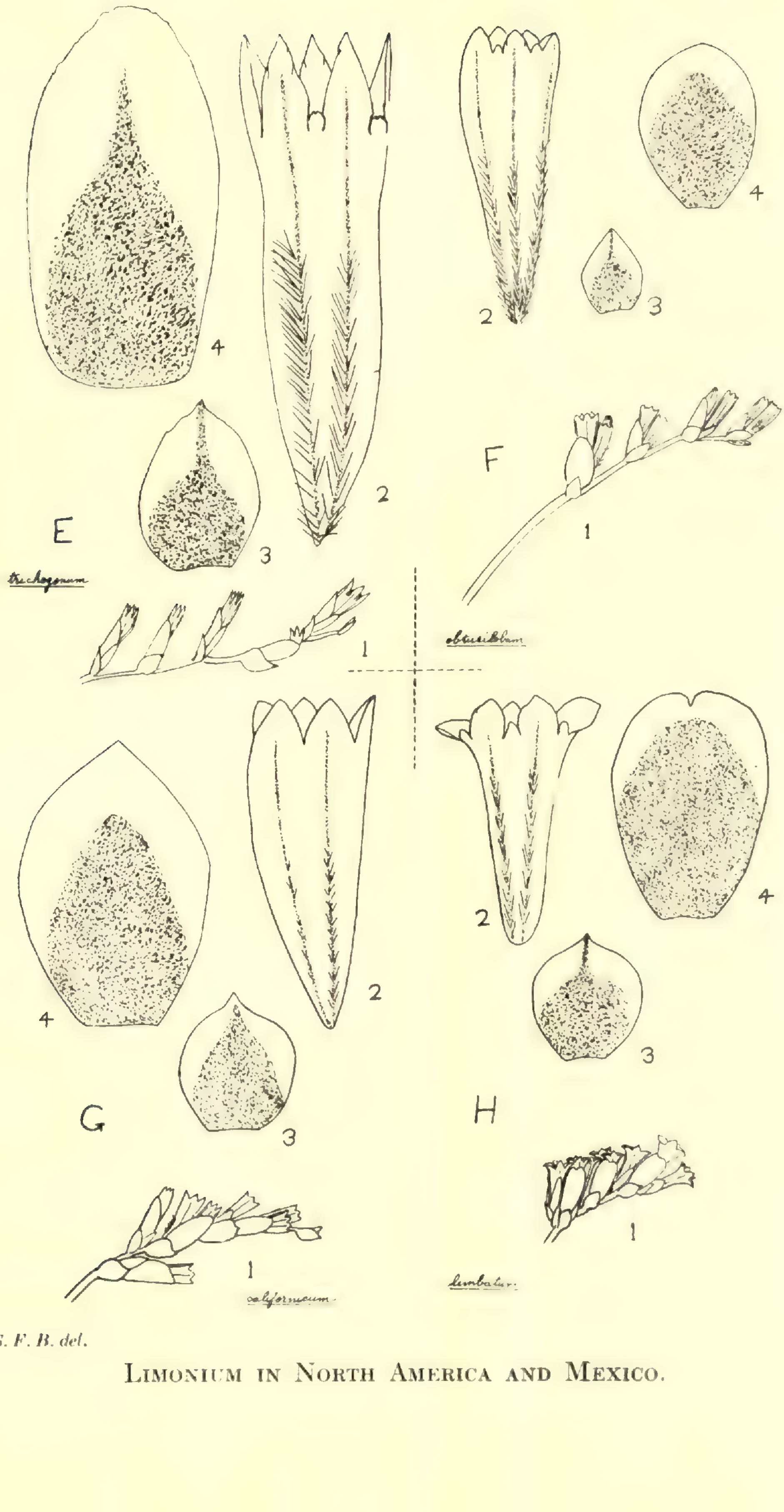


S. F. B. del.

LIMONIUM IN NORTH AMERICA AND MEXICO.



S. F. B. del.

LIMONIUM IN NORTH AMERICA AND MEXICO.

Rhodora

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ADDITIONAL NOTES ON RHODODENDRON MAXIMUM IN NEW HAMPSHIRE.

HAROLD ST. JOHN.

PROF. FARLOW's recent article recording the occurrence of *Rhododendron maximum* L. between Mt. Chocorua and Mt. Paugus [1] immediately called up the memory of my experiences with this plant in this immediate region. I wish here to put these on record.

During the summer of 1908, Mr. Piper, the proprietor of a hotel in Albany, New Hampshire, the Piper House, as it was then called, told me about a nearby patch of the Great Laurel. As soon as we could arrange the trip, he drove my mother and me to Chase Farm, a vantage point in the township of Albany, which is familiar to tourists. From here, following Mr. Piper's directions, we crossed the pasture on the opposite side of the road from Chase Farm and started into the woods in a westerly direction. After topping a wooded ridge, we slid down a steep bank and made our way across a thickly wooded swamp. On the opposite bank, by climbing up through a lumber slashing, we found a wood road and followed its winding course up the hillside. When we had travelled about a mile from Chase Farm, we left the wood road at a place where *Habenaria Hookeri* Torr. was abundant and turned to the right through the woods. On a north facing slope below an intervening cliff, we found the *Rhododendron maximum*. The trees, fifteen feet in height, made a solid stand over an acre of ground. It was so late in the season that we found but a single, undersized, belated flower.

[1] RHODORA, xviii. 25–26 (1916).

In the following summer, 1909, I had the pleasure of revisiting this station, in the company of our fellow member, Mr. Charles Schweinfurth, and in finding the trees in full bloom. Specimens were collected by each of us. I cite the one preserved in my herbarium, with corrected data: woods, one mile west of Chase Farm, Albany, Carroll County, New Hampshire, July 26, 1909, *H. St. John*, no. 170.

Chase Farm is most easily accessible from Conway, lying about two miles southeast by east from that village. This station for the *Rhododendron* is worthy of record not simply because it lies about six miles to the northeast of those recorded by Prof. Farlow, but because the trees were in such thriving condition and so thoroughly at home. It lies in the valley of the Swift River, in the township of Albany, instead of Conway, as I supposed at the time, and just within the boundaries of the new White Mountain National Forest.

Cambridge, Massachusetts.

NOTES ON NEW ENGLAND HEPATICAE,—XIII.[1]

Alexander W. Evans.

(Plate 120.)

In the recent parts of Rabenhorst's Kryptogamen-Flora, Müller treats the genera *Scapania*, *Radula*, and *Porella* (or *Madotheca*). He not only gives full descriptions of the various species represented in the European flora but appends interesting remarks on geographical distribution. Many of these remarks relate to North American records, and among the species which he cites from New England the following may be particularly noted: *Scapania Oakesii* Aust. (from New Hampshire), *S. paludicola* Loeske & K. Müll. (from Connecticut), and *Radula Lindbergiana* Gottsche (from Vermont). These species do not appear in the writer's Revised List of New England Hepaticae,[2] although *S. Oakesii* is really included under *S. dentata* Dumort. and *S. paludicola* under *S. irrigua* (Nees) Dumort. The reasons for con-

[1] Contribution from the Osborn Botanical Laboratory.

[2] Rhodora **15**: 21–28. 1913.

sidering them distinct will be given below. Müller's record for *Radula Lindbergiana* was based on specimens accredited to Miss Lorenz. She suspects, however, that there must be some error about them, and the occurrence of this species in North America, where it is surely to be expected, must therefore await further confirmation. According to Müller *Scapania gracilis* (Lindb.) Kaalaas, which has been twice reported from New England, is restricted to Europe and the Atlantic Islands, the North American specimens which have been referred to this species representing a form of *S. nemorosa* (L.) Dumort.; *S. gracilis*, therefore, should no longer be included in our flora.

Müller's treatment of the genus *Porella* is of especial interest to students in America, where most of the European species are represented. In New England three species, *P. pinnata* L., *P. platyphylla* (L.) Lindb., and *P. rivularis* (Nees) Trevis., have been reported. The writer now feels convinced, however, from the study of recent descriptions and a representative collection of specimens, that the true *P. platyphylla* is much rarer than supposed, being largely replaced by the closely related *P. platyphylloidea* (Schwein.) Lindb.; and that *P. rivularis* does not occur in eastern North America at all. The specific characters of the New England species are discussed below. It may be noted in this connection that a strong tendency prevails in Europe to supplant the old generic name *Porella*, dating from 1753, by the more recent name *Madotheca*, dating from 1822. The name *Porella* has been in use on this side of the Atlantic for many years, and Howe [1] has given excellent and convincing reasons for not giving it up. It is possible, at some future International Botanical Congress, that *Madotheca* may be placed among the "nomina conservanda". Until such action is taken, however, the writer would recommend that the use of the name *Porella* be maintained although, to avoid confusion, *Porella* and *Madotheca* are used interchangeably in some of the following discussions.

As in previous papers of this series additions to local state floras and a census of the New England species will be given at the close.

1. Scapania Oakesii Aust. Bull. Torrey Club. **3**: 10. 1872. *Scapania dentata*, ε. *Oakesii* K. Müll. Nova Acta Acad. Caes. Leop.-Carol. Akad. **83**: 102. 1905. On rocks and banks, mostly at elevations above 600 m. Maine: Big Alder Gorge near Round Mountain

[1] See Bull. Torrey Club **24**: 512–515. 1897; **25**: 96–103. 1898; Rev. Bryol. **25**: 76–78. 1898.

Lake, Franklin County (*A. Lorenz*). New Hampshire: White Mountains (*W. Oakes, C. F. Austin*, distributed in Hep. Bor.-Amer. *14*). Vermont: Handcock and Rochester [1] (*D. L. Dutton 633, 906*). In addition to the stations given by Austin and Howe the following station outside New England may be noted: valley of the Barrasois River, Cape Breton, Nova Scotia (*G. E. Nichols 294*).

The history of *Scapania Oakesii* gives evidence that its claims for recognition as a species are not very strong. As originally proposed by Austin it was based on four specimens, the first two from the White Mountains, New Hampshire, collected by Oakes, the third from the "Lake Superior region, Canada," collected by Macoun, and the fourth from "Observation Inlet, Columbia, Oregon," collected by Scouler. These are described as varieties α, β, γ and δ, respectively. In Hep. Bor.-Amer. *14* (1873) Austin distributed specimens from the White Mountains collected by Oakes and by himself. He compared the species with *S. undulata*, var. *purpurea* Nees, but emphasized the large spur-like teeth on the keels of the uppermost leaves as an important distinguishing character.

Nothing further was added to our knowledge of *S. Oakesii* until Howe [2] described and figured it from specimens which he found at Eureka and Kneeland Prairie Road, California. According to his account the plants from California are usually smaller than those from New Hampshire but agree closely with those from Observatory Inlet. He notes their superficial resemblance to *S. nemorosa* but considers them distinct both from this species and from *S. undulata* (L.) Dumort.

In his monograph of the genus *Scapania*, Müller,[3] in reducing *S. Oakesii* to a variety of *S. dentata* Dumort., stated that he had examined Austin's plant in two different sets of exsiccati. In one he found nothing but *S. nemorosa;* in the other a mixture of two plants, one being a green form of *S. undulata* and the other a reddish plant which he took to be the true *S. Oakesii*. He finds no important characters to separate this plant from *S. dentata*, and remarks that the carinal teeth, upon which both Austin and Howe laid emphasis, represent an uncertain character found now and then in many other species of *Scapania*. In the fourth series of the writer's Notes on New England

[1] The Rochester specimens were cited under *S. dentata* in Rhodora **12**: 204. 1911.
[2] Mem. Torrey Club **7**: 151. *pl. 108, 109.* 1899.
[3] Nova Acta Acad. Caes. Leop.-Carol. **83**: 102, 114. 1905.

Hepaticae,[1] the example of Müller is followed, and *S. Oakesii* is included among the synonyms of *S. dentata*.

A few years later Kaalaas [2] found an ambiguous *Scapania* in Söndmöre, Norway, at an altitude of 800 m. He considered it distinct from all the known European species and identified it as *S. Oakesii*, which he knew from description only. In distinguishing his plant from *S. dentata* and *S. undulata*, he again emphasizes the carinal teeth but states that this character is associated with a series of others, both lobes, for example, being rounded as in *S. subalpina* (Nees) Dumort., while the dorsal lobe arches far across the stem and the keel is curved. Müller [3] now shares the views of Kaalaas, at least to the extent of considering *S. Oakesii* a "kleine Art," and includes it among the species of Europe, citing the Norwegian station as the only one known at the present time. For North America he cites Eureka, California, in addition to the New Hampshire localities.

The writer has examined Austin's specimens of *S. Oakesii* in two sets of his exsiccati and has found in both cases a mixture of *S. undulata* and the plant which Müller regards as Austin's type. Since the *S. undulata* has no carinal teeth while the other plant exhibits them in abundance, Müller's views are clearly correct. The plant with the carinal teeth shows further the other characteristics pointed out by Kaalaas, and the same thing is true of the specimens from Maine and Vermont which are quoted above. The carinal teeth are by no means constant, some of the leaves developing five or more while others show few or none, but leaves with teeth of this character apparently occur on every well-developed stem and form a very striking feature of the species. In reinstating *S. Oakesii* as a member of the New England flora the writer admits that its characters are less definite than might be desired; at the same time they are fully as satisfactory as the characters of such species as *S. dentata*, *S. subalpina*, and *S. undulata*, species which are universally recognized but which are nevertheless connected by transitional forms. The four varieties distinguished by Austin need further investigation.

2. Scapania paludicola Loeske & K. Müll.; K. Müller, Rabenhorst's Kryptogamen-Flora **6**[2]: 425. *f. 125, 126.* 1915. In peat bogs. Maine: near Schoodic Lake, Piscataquis County (*A. W. E.*); Round

[1] Rhodora **8**: 41. 1906.
[2] Kgl. Norske Vidensk. Selsk. Skr. 1910[7]: 26. 1911.
[3] Rabenhorst's Kryptogamen-Flora **6**[2]: 460. 1915.

Mountain Lake, Franklin County (*A. Lorenz*). New Hampshire: Eagle Lake, Mt. Lafayette (*C. C. Haynes, A. Lorenz & A. W. E.*). Vermont: Bloodsucker Pond, Jamaica (*F. Dobbin*); Willoughby (*A. Lorenz & A. W. E.*); Franklin and Burke (*A. Lorenz*). Connecticut: Bethany (*A. W. E.*), cited by Müller; specimens from the same locality (*F. Bement*) but incorrectly labeled "Lebanon" were distributed in Hep. Amer. *190*, as *S. irrigua;* Norfolk and New Fairfield (*G. E. Nichols*); Bailey's Pond, Voluntown (*A. W. E.*). The following stations outside New England may likewise be recorded: St. Ann's Mountain, Cape Breton, Nova Scotia (*G. E. Nichols 213*); Campobello, New Brunswick (*W. G. Farlow*); St. Hubert, Quebec (*Brother Victorin*); near Ottawa, Ontario (*J. Macoun 1*); Port Clarence, Alaska (*W. H. Brewer & W. R. Coe 673*), cited by Müller; Podunk Marsh, West Fort Ann, New York (*S. H. Burnham*); near Superior, Wisconsin (*G. H. Conklin 1009, 1258*).

In describing *S. paludicola* as a "kleine Art," Müller calls attention to the strong superficial resemblance which it bears to *S. paludosa* K. Müll. In his opinion, however, the two species are not as closely related as might be supposed; he considers that *S. paludosa* has been derived from *S. undulata,* while *S. paludicola* has been derived from *S. irrigua.* In *S. undulata* and *S. paludosa* he finds that the leaf-cells are either thin-walled throughout or develop uniformly thickened walls (in which trigones are usually absent altogether), while in *S. irrigua* and *S. paludicola,* trigones are invariably present and may be very conspicuous. Apparently *S. paludicola* is not uncommon in northern North America, having been confused with *S. irrigua.* In fact several of the stations cited above have already been reported under the older species. Müller brings out the fact that *S. paludicola* prefers calcareous bogs, without being confined to them, and this preference is apparent from its North American stations.

The occurrence of *S. paludicola* in bogs, its robust habit, its deeply divided leaves, its short and arched keel usually without alar outgrowths of any sort, its deeply cordate dorsal lobes directed toward the apex of the stem rather than obliquely outward, and the trigones in its leaf-cells will usually make its recognition an easy matter. The margins of the leaves may be sparingly and minutely toothed or subentire and both lobes are often distinctly apiculate. The short and strongly arched keel and the cordate dorsal lobe directed forward will distinguish the species at once from both *S. irrigua* and *S. undulata,* while the trigones will readily separate it from *S. paludosa.*

3. Porella pinnata L. Sp. Plant. 1106. 1753. *Jungermannia Porella* Dicks. Trans. Linn. Soc. **3**: 239. *pl. 20, f. 1.* 1797. *Jungermannia distans* Schwein. Spec. Fl. Am. Sept. Crypt. 9. 1821. *Madotheca Porella* Nees (in part), Naturg. der europ. Leberm. **3**: 201. 1838. *Madotheca involuta* Hampe; Lehmann & Lindenberg, Pug. Plant. **7**: 10. 1838. *Cavendishia Porella* Carruth. Seemann's Jour. Bot. **3**: 301. 1865. *Madotheca Sullivantii* Aust. Bull. Torrey Club **3**: 15. 1872. *Porella Sullivantii* Underw.; A. Gray, Man., ed. 6, 709. 1890. *Madotheca microrhyncha* Tayl.; Stephani, Species Hepat. **4**: 251. 1910. [Text figs. 1–13.]

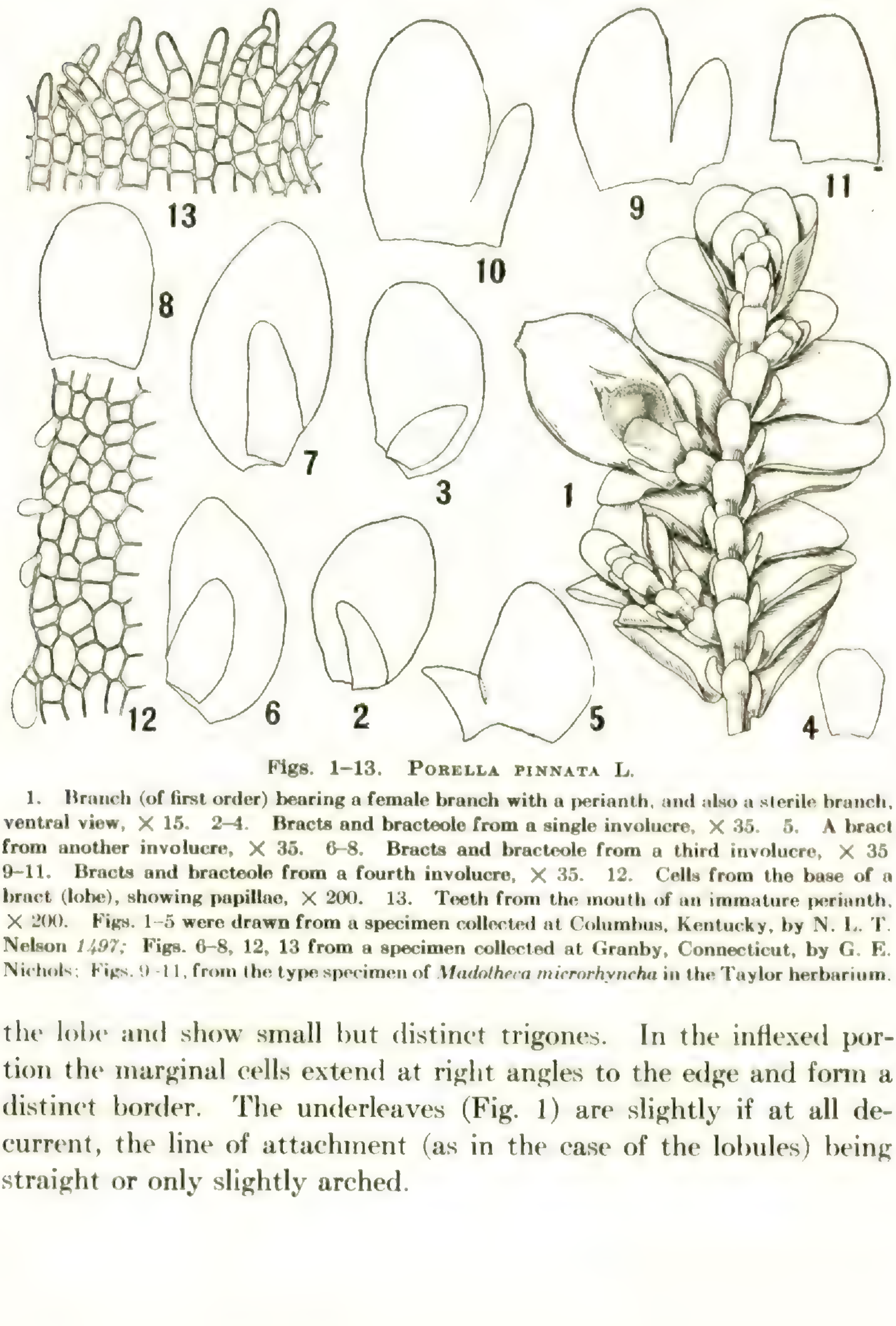
The geographical distribution of *P. pinnata* extends, in North America, from Nova Scotia westward to Ontario and Minnesota and southward to Cuba, Florida, and Louisiana, numerous stations being known from New England. In Europe its range is restricted to the British Isles and the western coast of France, with a possible extension into Portugal. In North America the species is abundant; in Europe, exceedingly rare. It grows on stones and logs in streams as well as on the banks, and is completely submerged during a part of the year. Apparently the sporophytes reach maturity only when the plants are exposed to the air.

The species has been repeatedly described so that little need be said about its general features and great variability. There are certain details, however, which the descriptions do not bring out very clearly, and a few words about these may be in place. Attention will likewise be called to certain synonyms of the species.

The complete, or almost complete, absence of marginal teeth on the leaves, underleaves and bracts, in a genus where teeth are so frequently present, is one of the most important characteristics of *P. pinnata.* Close to the dorsal base of the lobe, to be sure, close to the inner base of the lobule and along the margins of the perichaetial bracts and bracteoles a few slime papillae (or their vestiges) can be demonstrated (Fig. 12) and these are sometimes borne on short stalks, but even here anything approaching an actual tooth in size is exceedingly rare.

The lobes of the leaves (see Fig. 1) which are ovate to oblong in form and rounded at the apex, are attached by an arched line and are commonly plane except close to the lobule, where the margin is slightly inflexed. In plants exposed to the air this portion of the margin is often more or less involute. At the dorsal base the lobe is somewhat dilated but scarcely enough to be called cordate; at the ventral base

(where it meets the lobule) it is usually not dilated at all and may even be slightly decurrent, the keel being often obsolete. The small and narrow lobules, rounded or very bluntly pointed at the apex, are attached by a line which is straight or only slightly arched, and the inner edge is usually shorter than the outer, an unusual condition in the genus *Porella*. The leaf-cells average about 20 μ in the middle of



Figs. 1–13. Porella pinnata L.

1. Branch (of first order) bearing a female branch with a perianth, and also a sterile branch, ventral view, × 15. 2–4. Bracts and bracteole from a single involucre, × 35. 5. A bract from another involucre, × 35. 6–8. Bracts and bracteole from a third involucre, × 35 9–11. Bracts and bracteole from a fourth involucre, × 35. 12. Cells from the base of a bract (lobe), showing papillae, × 200. 13. Teeth from the mouth of an immature perianth, × 200. Figs. 1–5 were drawn from a specimen collected at Columbus, Kentucky, by N. L. T. Nelson *1497;* Figs. 6–8, 12, 13 from a specimen collected at Granby, Connecticut, by G. E. Nichols; Figs. 9–11, from the type specimen of *Madotheca microrhyncha* in the Taylor herbarium.

the lobe and show small but distinct trigones. In the inflexed portion the marginal cells extend at right angles to the edge and form a distinct border. The underleaves (Fig. 1) are slightly if at all decurrent, the line of attachment (as in the case of the lobules) being straight or only slightly arched.

The perichaetial bracts (Figs. 2, 3, 5–7, 9, 10) are not very fully treated in most descriptions, although Gottsche [1] has given a good account of them. They are commonly reduced to a single pair and the difference in size between the inner and outer bracts is not marked. The bracts are unequally bilobed, both lobe and lobule being ovate to oblong and usually rounded at the apex; in the case of the lobule, however, the apical portion is sometimes distinctly narrowed and the apex itself may be subacute. The bracteoles (Figs. 4, 8, 11) are oblong to obovate and usually rounded or truncate at the apex. According to Stephani [2] the lobule is lanceolate and long-attenuate, while the bracteole is suborbicular and highly coalescent on one side with a lobule. So far as the writer has been able to observe, however, the bracteole is usually quite free from the lobules, coalescence being either absent altogether or very slightly marked.

The mouth of the perianth is described as slightly crenulate, or minutely crenulate, or dentate. These expressions, however, do not depict the condition of the mouth accurately and were probably based on old and disintegrated specimens. In uninjured perianths (see Fig. 1) the mouth is shortly and closely ciliolate, the cilia varying from one to four cells in length (Fig. 13). The spores and elaters are well described by Howe.[3]

Of the synonyms cited above *Madotheca Sullivantii* and *M. microrhyncha* require a few words of explanation. *M. Sullivantii* was based on specimens collected by W. S. Sullivant in the "Alleghany Mountains" and distributed by Austin in his Hep. Bor.-Amer. *94*. It was first included among the synonyms of *P. pinnata* by Howe, but neither Stephani nor Müller follows his example. Stephani gives it among the synonyms of *M. Thuja*, while Müller [4] considers it a valid species. The specimens in Austin's distribution show, in the writer's opinion, that Howe was undoubtedly correct in considering the species synonymous with *P. pinnata*. They represent a small and slender form with perianths, and evidently grew in a more or less exposed position. The habit of the plants, which Müller emphasizes in maintaining the validity of the species, is not a constant feature and is not supported by characters drawn from the leaves and floral organs.

The habitat of *M. microrhyncha* is given by Stephani as "Ohio."

[1] Gottsche & Rabenhorst, Hep. Eur. *639* (accompanying text).
[2] Species Hepat. **4**: 252. 1910.
[3] Bull. Torrey Club **24**: 517. 1897.
[4] Rabenhorst's Kryptogamen Flora **6**^{2}: 571. 1915.

Through the kindness of Professor Farlow it has been possible to examine a portion of the type material from the Taylor herbarium. On the original packet the following words are written: "*Jungermannia microrhyncha* Tayl. Mss. (*Madotheca*). Ohio: Sir W. J. Hooker. 1843." Apparently Taylor had little faith in his species, for he never published it formally, but it is cited (as a manuscript species) among the synonyms of *Madotheca Porella* in the Synopsis Hepaticarum. Stephani was the first to give it adequate publication. Among the characters which he emphasizes are the following: the small, slightly projecting and minutely crenulate mouth of the perianth; the ovate-oblong lobes of the perichaetial bracts, rounded at the apex; and the small triangular lobules, discrete almost to the base. In *M. Porella* he gives, as more or less contrasting characters: the small, shortly rostrate, and minutely crenulate mouth of the perianth; the oblong and obtuse lobes of the perichaetial bracts; and the lanceolate lobules, discrete to about the middle. These differences, even if they were constant and accurately described, are so slight that they would have but doubtful specific value. As a matter of fact the type specimens, when compared with *P. pinnata*, do not show the differences which Stephani brings out. The two plants are essentially alike in all important respects, and there seems to be no reason for considering *M. microrhyncha* a distinct species. The same conclusion was reached by Underwood, who examined Taylor's type many years ago and placed it under *P. pinnata*.

Müller objects to the use of the specific name "*pinnata*" for the present species and gives two reasons. First, because he considers it disadvantageous to use so old a name for a plant which has been so much confused even in recent times; and, second, because Linnaeus could hardly have understood this plant under his *Porella pinnata* on account of its great rarity in Europe. These reasons are not very convincing. In the first place, writers who have used the specific name "*pinnata*" (such as Lindberg, Howe, Underwood, and Pearson) have used it in a very definite sense and have based their use of the name on the specimen in the Dillenian herbarium, which represents the type of the *Porella pinnata* of Linnaeus; and, in the second place, Linnaeus cites the species from Pennsylvania only, the date of its discovery in Europe being much later.

4. Porella platyphylla (L.) Lindb. Acta Soc. Sci. Fenn. **9**: 339. 1869. *Jungermannia platyphylla* L. Sp. Plant. 1134. 1753. *Antoiria vulgaris* Raddi, Mem. Soc. Sci. Modena **18**: 19. *pl. 2, f. 1.* 1818.

Cavendishia platyphylla S. F. Gray, Nat. Arr. British Pl. **1**: 690. 1821. *Madotheca platyphylla* Dumort. Comm. Bot. 111. 1822. *Porella Notarisii* Trevis. Rend. Ist. Lomb. II. **7**: 785. 1874. *Bellincinia platyphylla* O. Kuntze, Rev. Gen. Plant. 833. 1891. [Plate 120.]

On rocks and trees. Maine: Dover (*J. F. Collins 1685*); Vassalboro (*E. B. Chamberlain 966*). Vermont: Stowe (*E. G. Britton*); Willoughby (*E. Faxon; A. Lorenz & A. W. E.*); Jamaica (*F. Dobbin*). Connecticut: New Haven (*D. C. Eaton*); Brookfield, Sherman, and New Milford (*A. W. E.*); West Hartford (*A. Lorenz*). The following specimens from stations outside New England may likewise be recorded: Bic, Quebec (*A. W. E.*); Syracuse, New York (*L. M. Underwood & O. F. Cook*, distributed in Hep. Amer. *29*); Dresden Station, Adirondack Mountains, New York (*C. H. Peck 60*); Narrowsville, Pennsylvania (*T. P. James*); near Yellow Springs, Ohio (*W. S. Sullivant*, distributed in Hep. Bor.-Amer. *91b*, as *Madotheca rivularis*); near Big Bay, Lake Superior region, Wisconsin (*L. S. Cheney 5705*); Vermilion Lake, Minnesota (*Arthur, Bailey & Holway 114a*); Vasa, Minnesota (*N. L. T. Nelson 5, 945 1/2*); Fall Lake, Minnesota (*J. M. Holzinger*), male plants, doubtful; Iowa City, Iowa (*B. Shimek*). In Europe the species is exceedingly abundant.

Although *Porella* (or *Madotheca*) *platyphylla* has long been recognized as one of the commonest and most widely distributed of the Hepaticae, questions have arisen from time to time regarding the limitations of the species. By many writers it has been understood in a broad sense, with characters varying within wide limits, the variations, however, being thoroughly unstable and due to environmental conditions. By other writers it has been understood in a narrower sense, and one or more closely related species, forming with *P. platyphylla* a well-defined aggregate, have been distinguished. The difficulties involved were well stated by Nees von Esenbeck.[1] In discussing certain Mexican specimens of *Madotheca platyphylloidea*, the species most frequently segregated from *M. platyphylla*, he remarked that they were really intermediate between his earlier conceptions of these two species. And he stated further that two conclusions were possible: either, that *M. platyphylloidea* and *M. platyphylla* formed a single series of forms (that is, a single species), the extremes being connected by the Mexican specimens; or, that *M. platyphylloidea* should be made to include the forms which he had

[1] Naturg. der europ. Leberm. **4**: 497. 1838.

previously referred to *M. platyphylla* β *major*, thus ascribing to the two species ranges of variability different from those at first assigned. As to which conclusion was correct he made no attempt to decide. In spite of this uncertainty both species were recognized as valid in the Synopsis Hepaticarum, published a few years later by Nees von Esenbeck, in collaboration with Gottsche and Lindenberg.

Lindberg, in his revision of the Scandinavian species of *Porella*, published in 1869,[1] expressed the opinion that Nees von Esenbeck's "*M. platyphylloidea*" was a mixed species. He considered that part of it belonged to the var. *major* of *P. platyphylla*, and that the other part (which he thought might be synonymous with the original *Jungermannia platyphylloidea*) was a synonym of *P. Thuja* (Dicks.) Lindb. A few years later [2] he added the interesting observation that he had examined many North American specimens labeled *P. platyphylla* but that they were all referable to *P. Thuja*, and he commented on the rarity and restricted range of this latter species in Europe. Soon afterwards he published the combination *Porella platyphylloides* (Schwein.) Lindb.[3] and the same name reappears in his last general synopsis of the Scandinavian bryophytes.[4] Apparently he used this name as a substitute for *P. Thuja*, although this conclusion could hardly be deduced with certainty from his published writings. If he did make this substitution, it is difficult to understand why he preferred Schweinitz's specific name to the older name of Dickson, and it is to be regretted that he did not explain his use of the name *P. platyphylloides* more fully. In any case, however, it is clear that he considered Schweinitz's species distinct from *P. platyphylla*.

Among American writers the tendency has been to define *P. platyphylla* in a broad sense. This is the course pursued by Howe [5] in his treatment of the North American species of *Porella*, published in 1897. He admits that the species is very variable and that the common form in America corresponds with the *Jungermannia platyphylloidea* of Schweinitz better than with the common European form. He maintains, however, that the European form does occur in America and that there are so many transitional conditions that any attempt at segregation would be ill-advised.

A few years later an important paper on certain European species

[1] Acta Soc. Sci. Fenn. **9**: 329–345. 1869.
[2] Ibid. **10**: 493. 1875.
[3] Hepat. Utveckl. 20. 1877.
[4] Musc. Scand. 3. 1879.
[5] Bull. Torrey Club **24**: 521. 1897.

of *Madotheca* was published by Schiffner.[1] He not only recognized *M. platyphylloidea* as valid but segregated two other species from *M. platyphylla*, describing them as new under the names *M. Baueri* and *M. Jackii*. He pointed out further that Lindberg was in error when he confused *M. platyphylloidea* with *M. Thuja*, and he emphasized the fact that the true *M. Thuja* was a species of western and southern Europe, allied to *M. laevigata* (Schrad.) Dumort. rather than to *M. platyphylla*. Basing his opinion on the material at his disposal he stated that the true *M. platyphylla* was totally lacking in America, being everywhere replaced by *M. platyphylloidea*. The latter species he did not report from Europe at all, although he pointed out that *M. Jackii* was an exceedingly close ally. In his descriptions he laid especial stress on specific characters drawn from the sporophyte and particularly from the elaters. Some of these characters had been noted by previous writers but had not been employed to any great extent in separating species, and Schiffner deserves credit for recognizing their value.

In his monograph of the genus *Madotheca*, published in 1910,[2] Stephani accepts *M. Baueri* and *M. Jackii* as valid but does not follow Schiffner in his treatment of *M. platyphylloidea*. This species he includes among the synonyms of *M. Thuja*, as Lindberg had done forty-one years before. Both *M. Thuja* and *M. platyphylla* are quoted from Europe and North America. Although the sporophytes are described in the case of *M. Baueri* and *M. Jackii*, nothing is said about them in the descriptions of *M. Thuja* and *M. platyphylla*, so that Stephani apparently regards their features as of secondary importance.

Müller,[3] in his treatment of *M. platyphylla* and its allies, follows Schiffner in most respects but reduces *M. Jackii* to synonymy under *M. platyphylloidea* and thus gives the latter species a much wider geographical distribution than Schiffner had assigned to it. He quotes the true *M. platyphylla* from North America, Africa, and Asia, as well as from Europe, but restricts the range of *M. Baueri* to Europe. In his opinion *M. Baueri* is a "kleine Art," because he finds transitional conditions between the gametophyte of this species and that of *M. platyphylla*, but he apparently finds little difficulty in separating *M. platyphylloidea* from *M. platyphylla*.

(*To be continued.*)

[1] Lotos **48**: 346–350. 1900.
[2] Species Hepaticarum **4**: 241–315. 1910.
[3] Rabenhorst's Kryptogamen-Flora **6**[3]: 573–584. *f. 161, 164–166.* 1915.

REPORTS ON THE FLORA OF THE BOSTON DISTRICT,— XXII.

CARYOPHYLLACEAE.

AGROSTEMMA.

A. Githago L. Grain-fields and waste places, occasional.

ARENARIA.

A. lateriflora L. Grassland, frequent throughout.

A. peploides L., var. **robusta** Fernald (Rhodora xi. 109–115, 1909). Sandy and gravelly seashore, from Rockport northward, also at Scituate, Marshfield and Duxbury; King's Beach, Lynn, according to Tracy in Robinson, Fl. Essex Co. 38, 1880.

A. serpyllifolia L. Dry soil; frequent, and often abundant.

CERASTIUM.

C. arvense L. Coarse dry soil; occasional in central portion, especially near the coast.

C. vulgatum L. Gardens and waste places, common throughout.

DIANTHUS.

D. Armeria L. Dry fields and roadsides, occasional; rather abundant in Hingham and vicinity.

D. barbatus L. Escaped from cultivation at Beverly, Danvers, Wilmington, Westford, Sherborn and Scituate.

D. deltoides L. Escaped from cultivation at West Newbury, Winchester, Lexington, Ashland, Framingham, Sherborn, Hingham and Scituate.

GYPSOPHILA.

G. muralis L. Roadsides and fields, Dracut, Lowell, Bedford, Hopkinton, Wellesley, Hingham, rare.

LYCHNIS.

L. alba Mill. Waste places, frequent throughout.

L. chalcedonica L. Well established and spreading at Boxford

(*E. F. Williams*, Aug. 9, 1906); Scituate (*E. F. Williams*, July 9, 1898); old garden, Blue Hill Reservation, according to Deane, Fl. Metrop. Park Comm. 12, 1896.

L. COELI-ROSA Desv. Weed in garden, Cambridge (*C. F. Batchelder*, Sept. 13, 1913). From the Mediterranean region.

L. CORONARIA (L.) Desr. Danvers (*J. H. Sears*, July 5, 1885); Scituate (*Mrs. Henry T. Bailey*).

L. DIOICA L. Waste places, rare.

L. FLOS-CUCULI L. Fields and waste places, Gloucester, Chelmsford, Brookline, Milton, Easton.

SAGINA.

S. decumbens (Ell.) T. & G. Path halfway to Cranberry Pond, Braintree (*N. T. Kidder*, June 12, 1886).

S. nodosa Fenzl., var. **glandulosa** (Bess.) Asch. Rocks by seashore at Rockport and Gloucester, its southern limit.

S. procumbens L. Moist places; common along the coast, occasional inland.

SAPONARIA.

S. OFFICINALIS L. Waste places, common throughout.

S. VACCARIA L. Grain fields and waste places, rare.

SILENE.

S. antirrhina L. Dry gravelly soil and waste places, rather common throughout.

S. antirrhina L., forma **Deaneana** Fernald. (See Fernald, RHODORA xvii. 96–97, 1915, and Deane, RHODORA xii. 129–131, 1910.) "TYPE: recently cleared land near Winter Pond, Winchester, Massachusetts, June 22, 1913, *Fernald & Long*, no. 9494 (herb. New England Botanical Club)." Occasional with the species.

S. antirrhina L., var. **divaricata** Robinson. Wooded hillside, Lexington (*C. W. Swan & C. W. Jenks*, Aug. 6, 1883); Waltham (*W. Boott*, —, 1871); Newton Highlands (*J. R. Churchill*, July 28, 1888).

[S. APETALA Willd. In Dame & Collins, Fl. Middlesex Co., 15, 1888, is the following reference to this species: "Lexington, growing

with Anychia capillacea, on a wooded hillside, Aug. 6, 1883 (C. W. Jenks). Probably adv. from Eu." Prof. B. L. Robinson in Rhodora v. 235, 1903, states that this plant is *S. antirrhina* L., var. *divaricata* Robinson.]

S. armeria L. Waste places, occasional.

S. dichotoma Ehrh. Fields and waste places, at nine scattered stations.

S. gallica L. Reading (*W. H. Manning*, July 12, 1882, specimen in herb. N. E. Botanical Club).

S. latifolia (Mill.) Britten & Rendle. Waste places, common throughout.

S. noctiflora L. Waste places, frequent throughout.

S. pennsylvanica Michx. Dry sand and gravel, frequent in a belt from Medford and Dedham west; "reported at Danvers, Andover, and occasionally in other parts of the county," Robinson, Fl. Essex Co. 38, 1880; Scituate (*Mrs. Henry T. Bailey*).

SPERGULA.

S. arvensis L. A common weed in dry soil throughout.

SPERGULARIA.

S. canadensis (Pers.) Don. Mystic River marshes, Medford (*F. S. Collins*, Aug. 21, 1881, June 21, 1885); Cambridgeport, salt marshes, banks of Charles River (*B. L. Robinson*, Sept. 18, 1898); within tidewater, W. Boston flats (*C. W. Swan*, Sept. 26, 1882).

S. leiosperma (Kindb.) F. Schmidt. (See Rhodora xii. 157–163, 1910.) Salt marshes, common all along the coast.

S. rubra (L.) J. & C. Presl. Dry soil, common.

S. salina J. & C. Presl. (See Rhodora xii. 157–163, 1910.) Salt marshes, Gloucester, Nahant, Revere, Charlestown, Cambridge, Boston, Dorchester, Quincy, Scituate.

STELLARIA.

S. apetala Bernardinus. Weed in greenhouses, Cambridge (*M. L. Fernald*, April 30, 1906; specimen in Gray Herb.). Adventive from Europe.

S. AQUATICA (L.) Scop. Beside railway track, Newtonville (*C. J. Sprague*, August, 1881; specimens in Gray Herb. and herb. Boston Soc. Nat. Hist.).

S. borealis Bigel., var. **floribunda** Fernald. (See RHODORA xvi. 150–151, 1914). Waltham (*F. S. Collins*, June 17, 1886; specimen in herb. N. E. Botanical Club).

S. borealis Bigel., var. **isophylla** Fernald. (See above.) Wet woods and brooks in central portion of district, rare.

S. GRAMINEA L. Moist fields, frequent.

S. longifolia Muhl. Moist grassy places; Newburyport, Danvers, Andover, Lowell, Woburn, Brookline, Roxbury; Lynnfield and Salem, according to Robinson, Fl. Essex Co. 38, 1880.

S. MEDIA (L.) Cyrill. A very common garden weed in rich soil throughout, blossoming at all seasons.

S. uliginosa Murr. Wet places, occasional, but not reported south of Hingham and Canton.

PORTULACEAE.

PORTULACA.

P. OLERACEA L. A common garden weed in our territory and the least often collected.

[CLAYTONIA VIRGINICA L. is reported rather vaguely in Robinson, Fl. Essex Co. 40, 1880, but there are no specimens from Essex Co. in the herbarium of the Peabody Academy of Science.]

CERATOPHYLLACEAE.

CERATOPHYLLUM.

C. demersum L. Ponds and slow streams; occasional, but not reported south of Boston.

NYMPHAEACEAE.

BRASENIA.

B. Schreberi Gmel. Shallow ponds and slow streams, frequent.

CASTALIA.

C. odorata (Ait.) Woodville & Wood. Ponds and still waters, common.

NELUMBO.

N. lutea (Willd.) Pers. W. Peabody (*George Larrivee*, Aug. 14, 1913; *J. Dawson*, Aug. 22, ——); introduced, cove in Assabet River, Concord (*Martha Bartlett*, September, 1886; *W. Deane*, July 23, 1893); a large colony of it well established in a small pond near the railway in Lynnfield Center (*J. Richard Lunt*, Aug. 24, 1915).

NYMPHAEA.

N. advena Ait. Still water, common.

N. variegata (Engelm.) G. S. Miller. (See Rhodora xvi. 137–141, 1914.) Occasional, north and west of Boston.

N. microphylla Pers. Still water of Sudbury and Concord Rivers at Sudbury, Concord and Billerica; also at Round Pond, Woburn.

× ? **N. rubrodisca** (Morong) Greene. Martin's Pond, N. Reading (*A. S. Pease*, June 25, 1904; July 11, 1908); deep water of Concord River, Concord (*J. R. Churchill*, May 30, 1894).

C. H. Knowlton, Walter Deane } *Committee on Local Flora.*

NOTES FROM THE WOODS HOLE LABORATORY — 1915.

Edited by F. S. Collins.

I. Prasiola stipitata Suhr.

This species was found throughout the summer. It occurred at the Spindle Ledge on the surface of large boulders just above the high tide line where it was washed by spray. While not widely distributed, it grew luxuriantly where it was found. There is no indication from

its vegetative and reproductive vigor that it is not perfectly at home in this region. It has been previously reported[1] from Ireland, Norway, Sweden, Denmark, France, and Silesia.

During June and the first half of July it was found on only one stone. Later in the season, however, it had spread to other suitable spots in the neighborhood of the Spindle, and seemed to be in a fair way to become generally distributed. It forms a short dense turf, which seems at first sight to be composed of small Monostroma plants. The turf forms green patches a foot and more in diameter on the surface of the boulders.

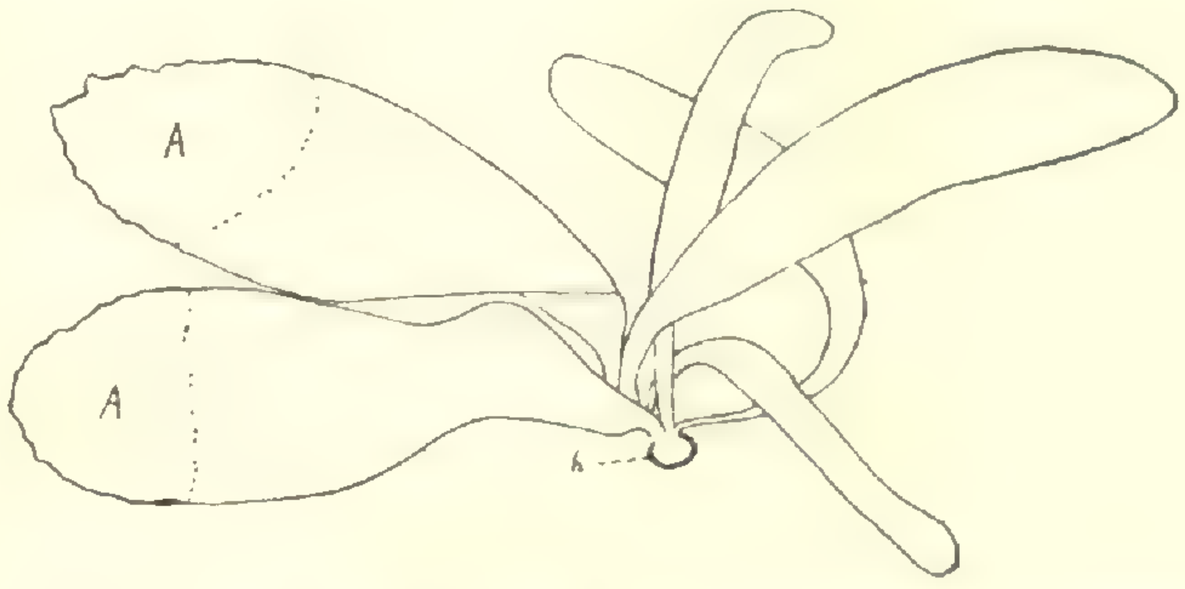


FIG. 1.— Prasiola stipitata, mature plant. A, regions of akinete formation and liberation. h, holdfast. × 20.

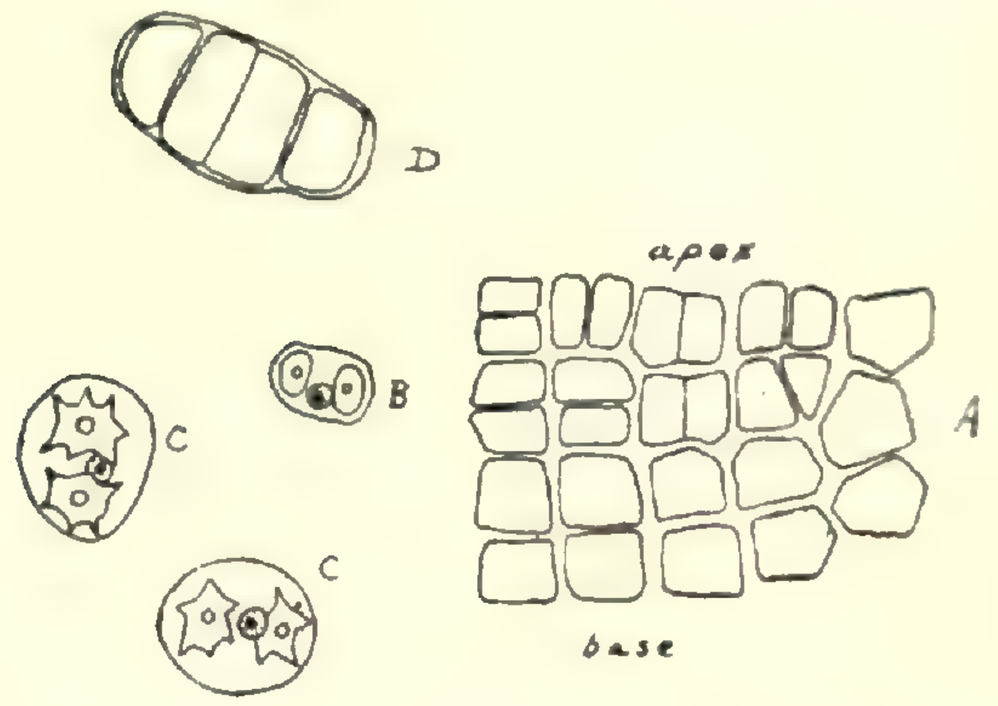


FIG. 2.— Prasiola stipitata. A, small portion of thallus, showing cells in rows. B, C, D, stages of akinetes. × 410.

The habit of the plant is characteristic, very much like Monostroma except that it is from the beginning filamentous and is never saccate. Several fronds arise from a single base (fig. 1).

Reproduction was found to be entirely by means of akinetes, as is characteristic of the family of Prasiolaceae. This method of reproduction was general and effective. From the standpoints of multiplication and dissemination of the species, the akinetes seem to be as efficient as the zoospores of the nearly related Ulvaceae. The akinetes are formed in large areas covering the ends of the fronds (fig. 1, A), and in these areas every cell is involved. The cells here cease to divide, and become less clearly green. At the same time the walls become swollen and softened. In this condition the walls dissolve along their outer faces, though the side walls persist for some time. Dissolution of the walls allows the

[1] De Toni, Sylloge Algarum, Pavia, 1889, Vol. 1, p. 145.

escape of the protoplasts as naked akinetes. These at first retain the shape they had when enclosed in the walls, but in a few hours round off and begin to increase in size. On germination, which takes place without any resting period, they produce short monosiphonous filaments (fig. 2, b, c, d). These become flat thalli, one cell in thickness, by cell-division in two planes.

Specimens of this alga, which was kindly identified by Mr. F. S. Collins, were prepared for distribution in the Phycotheca Boreali-Americana of Collins, Holden and Setchell.— I. F. Lewis.

II. Chamaesiphon incrustans Grun.

Chamaesiphon incrustans was found growing in great abundance on the leaves of Fontinalis sp. collected from a pond on Cuttyhunk Island. The leaves were found to be encrusted with *Coleochaete scutata* and occasional small plants of Bulbochaete. The Chamaesiphon appeared either in patches or scattered all over the surface of the Fontinalis leaves, in some cases running over the Coleochaete. This species probably has a very wide distribution, but has not hitherto been recorded from Massachusetts. Specimens were preserved for distribution in the Phycotheca.— I. F. Lewis and R. H. Colley.

III. Compsopogon coeruleus (Balbis) Mont.

Large floating masses of a species of Compsopogon were found in the summer of 1914 in the water garden on Mr. Charles R. Crane's estate by Dr. G. R. Lyman. In structure, size, and method of macro-aplanospore formation the species agrees with the description of *Compsopogon coeruleus* (Balbis) Mont. The normal habitat of this species is given [1] as Florida, the Antilles, and Algeria. Its presence as far north as Woods Hole is probably due to its introduction with water-plants sent from Florida. While vigorous and abundant in 1914, the species has not been found this season. It may have been winter-killed, or perhaps crowded out by a large species of Cladophora which has spread over the bottom of the pond.— R. H. Colley.

[1] Thaxter, R. Note on the structure and reproduction of Compsopogon. Bot. Gazette, Vol. 29, p. 259, 1900.

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Rhodora

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THE NEW ENGLAND BOTANICAL CLUB

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THE WINTER FLORA OF MUSKEGET ISLAND, MASSACHUSETTS.

W. L. McAtee.

While on Muskeget Island, Massachusetts, from November 24 to December 1, 1915, in the interests of the United States Biological Survey, the writer was enabled to make a collection of plants. The island was well covered and the collection is believed to be complete for the period indicated.

Muskeget is pure sand and is constantly being remodeled by wave action. The western side is now being worn away most rapidly. A keypost used by the Coast Guard was reset 27 paces inland during the spring of 1915, and in December it was apparent that the post would soon have to be moved again. It is said that formerly the island projected three-quarters of a mile farther on this side than it does now. Noticeable addition to the island seems to be limited to the southeast point.

The main body of Muskeget Island is approximately a semicircle with the diameter about a mile in length. The convex side is toward the north and at the southeast and southwest extremes are long points, the latter being much the longer. The south side of the island is occupied by 3 bays of which the middle one shoals off into a salt marsh which extends long arms into the body of the island. In the southeastern quarter of the island are a number of small fresh water marshes.

The strongest impression made by the vegetation of Muskeget Island, at the time the writer saw it, was due to the waving sea of straw-colored *Ammophila*. Dotted here and there were dark islands of which those occupying the elevations were largely composed of

beach plum, and those in the low spots of bayberry. Scattered among the *Ammophila*, and almost uniformly distributed were *Solidago sempervirens* and *Artemisia caudata*.

Nowhere has the writer seen poison ivy so common, nor so peculiar in habit. There being nothing on which to climb, it simply sprawls over the sand. It is vigorous, however, taking complete possession of some areas and producing an enormous crop of fruit. Indeed while walking over most parts of the island, one's footsteps are accompanied by a constant rattle of dislodged poison ivy fruits.

In the fresh water marshes, which in origin are detached extremities of arms of the salt marsh or depressions between old beaches, there is an interesting zonation of plants. The outer or shrubby zone is composed largely of bayberry and *Rosa humilis* threaded with *Rubus procumbens* and toward the inner side with *Spiraea tomentosa*, *Aster novi-belgii* and *Agrostis perennans*. The next zone, rather an indefinite one is that of *Scirpus cyperinus* and cat-tails. The inner basin of the marshes usually is a mass of *Juncus canadensis*, and *Aspidium thelypteris* with scattered *Scirpus cyperinus*. In one marsh this area is partly taken up by a bed of sphagnum and *Vaccinium macrocarpon*.

In the salt marsh, there is a strand zone where grow *Spergularia leiosperma* (found to some extent elsewhere), *Salicornia mucronata*, *S. europaea* and *Suaeda linearis*. The next zone is dominated by *Spartina patens*, among which are scattered *Limonium* and *Salicornia ambigua*. The next zone is occupied by *Spartina glabra* var. *pilosa*, beyond which no emersed vegetation appears, but submerged eel-grass is abundant.

The shrubs on Muskeget, particularly the beach plum, are covered with lichens, among which are *Lecanora varia* (Ehrh.) Ach., *Parmelia sulcata* Tayl., *Ramalina calicaris* (L.) Nyl., and *Usnea florida* (L.) Hoffm. Two lichens [1] grow commonly on the sand, namely, *Cladonia sylvatica* (L.) Rabenh. forma *laxiuscula* Del. and *Cladonia boryi* Tuck. forma *reticulata* (Russ.) Merl.

The number of species of vascular plants collected on Muskeget Island was 54 of which 9 seem clearly to have been recently introduced by man. A small patch of turnips was cultivated during the summer of 1915 and at the time of my visit there remained on this area some of the turnip plants, and a few pioneers of the irrepressible *Panicum*

[1] All of these lichens were kindly identified by Mr. G. K. Merrill.

capillare. On a single refuse heap near a fisherman's house were found the only specimens of mullein, wild carrot, *Raphanus raphanistrum*, *Poa pratensis*, *Triticum sativum*, and *Festuca rubra*, and only in the vicinity of fishing shacks were *Chenopodium album* and *Convolvulus sepium* obtained.

The vascular plants found on Muskeget Island belong to 23 families of which 16 are represented by only one species each; while the Rosaceae have 6 species, the Chenopodiaceae and Compositae 8 each, and the Gramineae 9 species.

Such is the general summary of the winter flora of a mile-wide and isolated sand patch twenty miles off the southern shore of Cape Cod, Massachusetts.

LIST OF SPECIES.[1]

POLYPODIACEAE.

ASPIDIUM THELYPTERIS (L.) Sw.—The only fern present; abundant in fresh water marshes; covered with fruit dots.

TYPHACEAE.

TYPHA LATIFOLIA L.—Numbers present in a few of the fresh water marshes.

NAIADACEAE.

ZOSTERA MARINA L.—Exceedingly abundant in shoal waters surrounding Muskeget.

GRAMINEAE.

PANICUM CAPILLARE L.—Only in a little garden; mature fruit.

AGROSTIS PERENNANS (Walt.) Tuckerm.—The long, thin culms growing up among shrubs in the fresh water marshes.

AMMOPHILA ARENARIA (L.) Link.—The most abundant plant; mature fruit.

SPARTINA GLABRA Muhl. var. PILOSA Merr.—The outermost emersed plant of the salt marsh; mature fruit.

[1] Identification of plants mentioned in this list was kindly made by Professor M. L. Fernald, with the exception of 3 species of grasses named by Professor A. S. Hitchcock.

Spartina patens (Ait.) Muhl.— The dominant plant of the shallower parts of the salt marsh; spikelets fallen.

Phragmites communis Trin.— One considerable colony on rather high ground.

Triticum sativum L.

Poa pratensis L.

Festuca rubra L.— Of the last two and of this species there was found only one tuft of each on a fisherman's refuse heap.

CYPERACEAE.

Scirpus cyperinus (L.) Kunth.— Common in fresh water marshes.

JUNCACEAE.

Juncus canadensis J. Gay.— The dominant plant of the central parts of the fresh-water marshes; capsules empty.

MYRICACEAE.

Myrica carolinensis Mill.— Abundant about margins of marshes and other damp spots; in full fruit.

POLYGONACEAE.

Rumex acetosella L.— Very abundant, growing both in the open and in shade of other plants.

Polygonum acre HBK. var. leptostachyum Meisn.— Common in fresh marshes; mature fruit.

CHENOPODIACEAE.

Chenopodiuum album L.— A few plants on fisherman's refuse heap.

Atriplex patula L. var. hastata (L.) Gray.— Scattered rosettes seen; mature fruit.

Atriplex arenaria Nutt.— Mature fruit.

Salicornia mucronata Bigel.

SALICORNIA EUROPAEA L.— These two species on strand of salt marsh.

SALICORNIA AMBIGUA Michx.— Growing among *Spartina patens*.

SUAEDA LINEARIS (Ell.) Moq.— Scarce; mature fruit.

SALSOLA KALI L. Frequent; mature fruit.

CARYOPHYLLACEAE.

SPERGULARIA LEIOSPERMA (Kindberg) F. Schmidt.— Frequent on strand of the salt marsh.

ARENARIA PEPLOIDES L. var. ROBUSTA Fernald.— Several mats on Southwest point, scarce elsewhere.

CRUCIFERAE.

LEPIDIUM VIRGINICUM L.— Common, scattered everywhere; mature fruit.

CAKILE EDENTULA (Bigel.) Hook.— Frequent; flowers to mature fruit.

RAPHANUS RAPHANISTRUM L.— Only on fisherman's refuse heap.

ROSACEAE.

SPIRAEA TOMENTOSA L.— Frequent in shrub zone of the fresh water marshes.

FRAGARIA VIRGINIANA Duchesne.— In high dry situations; infrequent.

RUBUS PROCUMBENS Muhl.— Abundant; most plentiful in shrub zone of fresh water marshes.

ROSA RUGOSA Thunb.— One clump about 25 feet in diameter, which is known to have originated from a single bush brought ashore by the tide some 7 to 8 years ago; called "JAPANESE ROSE"; mature fruit.

ROSA HUMILIS Marsh.— Rose bushes are abundant and if the curved or straight shape of spines is a safe criterion, both this species and R. VIRGINIANA Mill. are represented. The straight-spined plants tend to be restricted to the higher ground, and those with curved spines to the swamps; fruit present.

PRUNUS MARITIMA Wang.— Abundant; apparently the only plant of economic value. The crop of fruit is said usually to be large.

LEGUMINOSAE.

Lathyrus maritimus (L.) Bigel.— Fairly common; confined to vicinity of shore.

ANACARDIACEAE.

Rhus toxicodendron L.— Abundant, sprawling over the sand on higher ground and occupying some areas exclusively. The fruiting branches are erect, usually only a few inches high, and never over eighteen. In one instance seen climbing between shingles forming side of fisherman's house. Fruit very abundant.

HYPERICACEAE.

Hypericum virginicum L. Scarce in swamps; capsules empty.

ONAGRACEAE.

Oenothera muricata L.— Fairly common; mature fruit.

UMBELLIFERAE.

Daucus carota L.— One plant on fisherman's refuse heap.

ERICACEAE.

Vaccinium macrocarpon Ait.— Plentiful in one fresh-water marsh which this plant and sphagnum are transforming into a bog; fruit present.

PLUMBAGINACEAE.

Limonium carolinianum (Walt.) Britton.— Frequent in outskirts of salt marsh.

CONVOLVULACEAE.

Convolvulus sepium L.— A few plants near fishermen's cabins.

LABIATAE.

TEUCRIUM CANADENSE L. var. LITTORALE (Bicknell) Fernald.—Fairly common; mature fruit.

SCROPHULARIACEAE.

VERBASCUM THAPSUS L.—A few plants on fisherman's refuse heap.

COMPOSITAE.

SOLIDAGO SEMPERVIRENS L.—Abundant, scattered everywhere, still in flower.

ASTER NOVI-BELGII L.—Frequent in shrub zone of fresh water marshes, particularly on the inner border of this area; mature fruit.

GNAPHALIUM POLYCEPHALUM Michx.—Common on higher land; empty involucres.

XANTHIUM ECHINATUM Murr.—Not common; mature fruit.

ARTEMISIA CAUDATA Michx.—Abundant, scattered everywhere in drier soil; involucres empty.

ARTEMISIA STELLERIANA Bess.—Infrequent; involucres empty.

ERECHTITES HIERACIFOLIA (L.) Raf.—Common in both wet and dry situations; involucres empty.

LACTUCA CANADENSIS L.—Infrequent; mature fruit.

BIOLOGICAL SURVEY, Washington, D. C.

A CALCIPHILE VARIETY OF ANDROMEDA GLAUCOPHYLLA.

M. L. Fernald.

The common *Andromeda* of eastern America, *A. glaucophylla* Link.[1] is characteristic of acid peat and inundated sphagnous bogs. So generally is this the case that, in 1910, when Professor Wiegand and the

[1] *A. glaucophylla* Link, Enum. Pl. Hort. Berol. pars. i. 394, was listed in the enumeration immediately after *A. Polifolia* with which Link obviously did not consider it identical. Link's description was as follows:

"3960. A. GLAUCOPHYLLA. Foliis linearibus margine revolutis subtus albidis, floribus aggregatis terminalibus, pedunculis corolla ovata parum majoribus, antheris versus apicem aristatis. A. polifolia *β Pursh am.* i. 291. Differt a praecedente cui similis pedunculorum magnitudine, qui in illa duplo longiores corolla et ultra. Folia subtus alba nec tomentosa. Glandulae inter stamina."

From this it would appear that Link was giving a specific name to *A. Polifolia β* of Pursh. The latter plant, as Pursh's treatment shows, was the earlier published *A. Polifolia, α latifolia* Ait. Hort. Kew. ii. 68 (1789) from North America, as contrasted with his *A. Polifolia β media*, the "Common Marsh Andromeda, or Wild Rosemary" of Britain. As already shown by the present writer in Rhodora, v. 67–71 (1903), the European *Andromeda Polifolia* differs in many characters from the common American plant, *A. Polifolia* with us being an arctic and subarctic species of very doubtful occurrence along the northern borders of the United States. In addition to definite fruit-characters, the common American plant differs from the European in its more glaucous new shoots and mature foliage, its shorter thicker pedicels (rarely twice as long as the corolla; the pedicels of *A. Polifolia* being 2–4 times as long as the corolla), in more spreading whitish sepals, and in having the lower surfaces of the leaves very minutely tomentulose (under a strong lens), not glabrous as in the European species. The writer has previously identified the common American shrub with Link's *A. glaucophylla;* but recently Dr. J. K. Small, asserting that *A. glaucophylla* is true *A. Polifolia*, has described the common American plant as a new species, *A. canescens* Small in N. A. Fl. xxix. pt. 1, 61 (1914). As leading characters of his new species, *A. canescens*, Small recognizes the "pedicels once or twice as long as the corolla or capsule" as opposed to *A. Polifolia* with "pedicels several times as long as the corolla or capsule" and calyx with "lobes. . . usually whitish and spreading" as opposed to *A. Polifolia* with "lobes. . . usually reddish or pale, and ascending."

In thus reducing Link's *A. glaucophylla* to *A. Polifolia* with very long pedicels and ascending reddish calyx-lobes, it would seem that Dr. Small has laid emphasis upon only a minor point in Link's description; for, as indicated by its most pronounced characters, Link was clearly describing, as were Aiton and Pursh before him, the common American species recently rechristened *A. canescens*. Thus, in his account Link very particularly emphasizes the short peduncles, saying: "peduncles little longer than the ovate corolla," and again "Differs from the preceding [*A. Polifolia*] to which it is similar, in the length of the peduncles, which in that [*A. Polifolia*] are twice as long as the corolla and more." Furthermore, in the description of *A. Polifolia α latifolia* Ait. or *β latifolia* Pursh, the earlier published plant to which Link gave the binomial *A. glaucophylla*, both Aiton and Pursh emphasized the calyx-character which distinguishes Small's *A. canescens*, both saying: "laciniis calycinis patentibus ovatis albis." The contradictory, or possibly contradictory statement is Link's "Folia subtus alba nec tomentosa." If this comment contrasted *A. glaucophylla* with the preceding species, it alone would indicate the possibility that Link's species is *A. Polifolia;* if, on the other hand, it was meant to contrast *A. Polifolia* with *A. glaucophylla* there is no dilemma. In view of the short peduncles and the spreading white calyx-lobes emphasized in the original descriptions of *A. glaucophylla* or of *A. Polifolia β latifolia* Pursh (or *α latifolia* Ait.) upon which it rests, there had appeared to the

writer were botanizing on the west coast of Newfoundland, it was a great surprise to find the species, very dwarfed but freely fruiting, on the limestone barrens about Ingornachoix Bay. In fruit the material from the limestone barrens seemed inseparable from the dwarfest extremes of the common plant of acid peats; but in 1914 Mr. Harold St. John and the writer were fortunate enough to find a dwarfed plant, which was quite similar in aspect to the Ingornachoix Bay material, forming extensive mats on the limestone tableland of Table Mountain, back of Port à Port Bay. There the tiny shrub was associated, as it was about Ingornachoix Bay, with very characteristic calciphiles: *Equisetum variegatum* Schleicher, *Poa alpina* L., *Kobresia caricina* Willd., *Juncus triglumis* L., *Tofieldia palustris* Huds., *Salix vestita* Pursh, *Anemone parviflora* Michx., *Lesquerella arctica* (Richardson) Watson, var. *Purshii* Watson, *Saxifraga oppositifolia* L., *Potentilla nivea* L., *Dryas integrifolia* Vahl., *Viola nephrophylla* Greene, *Lobelia Kalmii* L., *Erigeron hyssopifolius* Michx., etc.—an association of plants which we never find in the acid peats and sphagnous bogs where typical *Andromeda glaucophylla* abounds.

On Table Mountain the Andromeda was in full flower and we were at once impressed by the fact that the corolla was much shorter than in the familiar bog-shrub, and oblate-globose in form, shorter than broad; the longer corolla of typical *A. glaucophylla* being ovoid-urceolate. In typical *A. glaucophylla*, furthermore, the anthers are pale brown in color; in the Table Mountain plant purple or purplish-black and unusually short, while the filaments, too, are shorter and broader-based than in the plant on the acid bogs. One other character, apparently *post mortem*, is of interest. In practically all the specimens of the Table Mountain plant with oblate-globose corollas and purple anthers, the corollas, under pressure, have split deeply into five lobes, so that in the herbarium-material the corollas have become campanulate, thus strongly suggesting those of *Cassiope*.

writer to be no real doubt that Link was describing the common American representative of the European species; but on account of the different interpretation by Dr. Small, it has seemed wise to have the type of Aiton's var. *latifolia*, upon which *A. glaucophylla* rests, examined. This was kindly undertaken by Mr. S. F. Blake, who in a letter of February 3, 1915, wrote: "*a latifolia* Ait. Type (ex. Hort. Pitcairne, 1778) is *A. glaucophylla* of Manual, ed. 7, with oblong slightly revolute leaves tomentulose beneath, the larger 3–4 cm. × 6–10 mm. Tracing sent."

Whether Link had material which was essentially different from that of Aiton cannot now be readily determined, but in view of the emphasis given by Link to the short peduncles and the clear identification of Aiton's var. *latifolia*, there seems no reasonable doubt that *A. canescens* Small is *A. glaucophylla* Link.

In very rare instances short subglobose corollas occur on the bog plant with pale anthers, and in one case typical *A. glaucophylla* has been seen with a tendency to *post mortem* splitting of the corolla; but, differing from the true *A. glaucophylla* in its almost unique corolla and anther-characters, the plant of the Newfoundland limestones seems to be worthy at least varietal designation.

In its very reduced foliage and in its fruit and its spreading whitish calyx-lobes the limestone plant is quite inseparable from dwarfed extremes of true *A. glaucophylla*. In fact, the original material of Aiton's *A. Polifolia γ angustifolia*, which was collected by Sir Joseph Banks at Croque in northeastern Newfoundland and which has been compared for the writer by Mr. Blake, is quite inseparable from the Table Mountain plant in its foliage; but most unfortunately the Aiton type is quite destitute of flowers. Pursh, taking up Aiton's *γ angustifolia* as *α angustifolia*, said: "I strongly suspect the variety *α* to be a distinct species which might be called *A. rosmarinifolia*"; but owing to the lack of flowers on the Aiton material it is now quite impossible to say whether it is a dwarf form of true *A. glaucophylla* or the plant of Table Mountain. Under these circumstances the Table Mountain plant may be called

ANDROMEDA GLAUCOPHYLLA Link., var. **iodandra**, n. var., depressa, ramis 0.3–1.5 dm. altis; foliis linearibus 1–2.4 cm. longis valde revolutis; corollis oblato-globosis 3–4 mm. longis in statu siccato campanulatis valde lobatis; antheris purpureis vel atropurpureis 0.6–0.8 mm. longis, filamentis 1.4 mm. longis basi latis.

Depressed; the branches 0.3–1.5 dm. high: leaves linear, 1–2.4 cm. long, strongly revolute: corolla oblate-globose, 3–4 mm. long, in the dried condition campanulate and deeply lobed: anthers purple or purplish-black, 0.6–0.8 mm. long; filaments 1.4 mm. long, broad at base.— NEWFOUNDLAND: in humus or turf on the limestone tableland, altitude 200–300 m., Table Mountain, Port à Port Bay, July 16 and 17, 1914, *Fernald & St. John*, no. 10,857 (TYPE in Gray Herb.). Fruiting specimens from dry rocky limestone barrens, near sea-level, Ingornachoix Bay, August 2 & 4, 1910 (*Fernald & Wiegand*, nos. 3,840, 3,841) seem to belong here.

GRAY HERBARIUM.

NOTES ON NEW ENGLAND HEPATICAE,—XIII.

Alexander W. Evans.

(*Continued from page 85.*)

In *P. platyphylla*, according to Müller and other recent writers who define the species in a narrow sense, the secondary stems are more or less regularly bipinnate or even tripinnate, thus giving the shoot-system a fern-like appearance; the lobes of the leaves are closely imbricated and ovate when spread out flat, the base being cordate, the apex rounded, and the margin entire or nearly so; the lobules are much smaller than the lobes, about half again as wide as the stem, ovate, gradually narrowed toward the blunt apex, scarcely or not at all decurrent at the base, recurved along the outer side, and entire along the margin; the leaf-cells average 25 μ in diameter in the middle of the lobe, the cell-walls are thin and the trigones small and triangular; the underleaves are two or three times as broad as the stem and about twice as wide as the lobules, their outline is rotund-quadrate, and they are broadly long-decurrent on both sides, the decurrent portion being sometimes sparingly toothed, while the rest of the margin is narrowly revolute and entire; the perichaetial bracts, which are reduced to a single pair, are smaller than the leaves, and subequally bifid one-half to two-thirds, the lobe being blunt, the lobule pointed, and the margin entire throughout; the perichaetial bracteole is broadly oval, entire, and reflexed in the upper part; the perianth is shortly pyriform, bluntly three-keeled in the lower part and dorsi-ventrally compressed in the upper part, the mouth being two-lipped and bearing scattered teeth; the capsule is deeply divided into four valves, which are often unequal and further subdivided; the wall of the capsule is two or three cells thick, the cells of the outer wall having small triangular trigones; the spores measure 45–55 μ in diameter, and the elaters measure 8 μ in diameter and have two spirals extending to their very ends. In the var. *subsquarrosa* Schiffn., which Müller admits has been the cause of confusion, the lobes of the leaves are broadly ovate, the lobules are broader than in the type but are still narrower than the underleaves, and the cell-walls average about 30 μ in diameter in the middle of the lobe.

A study of numerous specimens, both European and North Ameri-

can, in which the elaters were bispiral throughout, showed that some of the gametophytic characters relied upon by Müller were subject to variation, although his characterization of the species was essentially correct. In considering these variations the lobes, the lobules, the underleaves, the bracts and bracteoles, and the mouth of the perianth will be taken up in order. The leaves and underleaves discussed are in all cases those of the stem itself.

Although the lobes are normally ovate as described (see Figs. 1, 2, 4, 5) they are sometimes as broad as long and may be practically orbicular in outline (Figs. 3, 6). The cordate condition of the base, moreover, is not always as clear as might be desired. At the junction with the short keel, to be sure, the base is distinctly dilated into a cordate expansion, which may be either plane, or slightly crispate or revolute, but this expansion is by no means as constant on the other side of the lobe. In the case of the lobes shown in Figs. 4 and 5 the basal dilations are distinct enough, and similar dilations are shown in Figs. 1 and 2; but in Figs. 3 and 6 the lobe gradually narrows toward the base and is actually short-decurrent. It should be noted in this connection that the line of attachment of the lobe is strongly arched, so that the extent of the decurrent portion is not easy to define. The margin of the lobe is not quite so uniformly entire as Müller's description implies, and the portion of the margin which extends from the dorsal base to the apex is frequently more or less dentate. The teeth, which in some cases at least mark the position of slime papillae, are exceedingly irregular in size, in number and in distribution, and they are usually little more than blunt and vaguely defined projections (Figs. 1, 2, 5). Sometimes, however, they are sharper, and it is not unusual to find one or two sharp and minute teeth close to the base (Figs. 1, 2). Aside from these basal teeth, a larger and very variable tooth about midway between the base and the apex is fairly frequent. The presence of teeth on the lobe is briefly alluded to by Warnstorf.[1]

In the case of the lobule the line of attachment is even more sharply arched than in the case of the lobe and makes the degree of decurrence even more difficult to define clearly. Perhaps the most accurate method would be to consider the lobule decurrent only when the inner edge extends farther backward than the outer edge, and this is apparently what is implied in Müller's description. His account of the

[1] Kryptogamenflora der Mark Brandenburg **1**: 270. 1902

form and relative width of the lobule could hardly be improved upon, but here again the margin is not invariably entire as he maintains. A very few minute and irregular teeth may be present along the inner edge (especially when this is slightly decurrent) and also close to the junction with the lobe, where the lobule is more or less dilated.

Müller's description of the leaf-cells and underleaves portrays very accurately the conditions which are present in the material studied by the writer. On account of the strongly arched line of attachment of the underleaves the decurrent portion is vaguely delimited from the portion which is not decurrent, but in any case the decurrence is strongly marked.

His account of the perichaetial leaves, however, deserves a little amplification. The two bracts are usually unequal in size, the one (see Fig. 7) which is turned toward the apex of the axis bearing the female branch (that is, the outer bract) being the smaller of the two. Although the lobe and lobule are frequently of about the same size, it is more usual for the lobe to be distinctly larger than the lobule (see Figs. 7, 8), and the apices of both lobe and lobule vary from acute to obtuse or even rounded. Marginal teeth are sometimes absent but this is by no means invariably the case. In some of the bracts examined both lobe and lobule bore a number of scattered irregular teeth, some of which were little more than projecting cells while others were larger and more lobe-like. In connection with some of the teeth vestiges of slime papillae could be discerned. Similar teeth are sometimes present on the perichaetial bracteole (Fig. 9).

In European specimens of *P. platyphylla* the mouth of the perianth with its scattered teeth (Fig. 10) presents a very distinctive appearance. Each lip usually bears from fifteen to twenty teeth, and the teeth themselves vary from single projecting cells to cilia four or five cells long and one cell wide throughout or to triangular teeth as long as such cilia but three or four cells wide at the base. The teeth are exceedingly fragile, and their peculiarities cannot always be made out from old and weathered perianths. Fortunately the perianth starts to develop even when no archegonia are fertilized and, since the mouth is the first part to mature, the undeveloped perianths dissected out from unfertilized inflorescences will usually show the marginal teeth clearly.

In the North American specimens which the writer would refer to *P. platyphylla* the teeth show a tendency to be more crowded than in the European specimens, a condition which Figs. 11–14 clearly bring

out. Some of the teeth, moreover, are large and compound and show a development of secondary teeth. Teeth of this character are represented in Fig. 11, which shows one of the sinuses between the lips of the perianth, and also in Fig. 14, which unfortunately is taken from a specimen without mature capsules. Sometimes a few surface cells close to the mouth project slightly, as shown in Fig. 13.

The sporophytic characters of *P. platyphylla* are well described by Müller. It might perhaps be added that the two spirals in the elaters are continuous at the extreme ends and form loops. This interesting feature is brought out by Schiffner and is very evident in both European and North American material. The writer is inclined to follow Schiffner and Müller in restricting the name *P. platyphylla* to plants in which the elaters are bispiral. The difficulties in determining material without capsules will be discussed under *P. platyphylloidea*.

The third species of *Porella* which has been reported from New England is *P. rivularis* (Nees) Trevis., the full description of which by Howe [1] may be consulted. This species has been more or less confused with both *P. pinnata* and *P. platyphylla*. Although the name *P. rivularis* has been in widespread use for a considerable period, Müller [2] has recently shown that the oldest synonym for the species is *Jungermannia Cordaeana* Hüben.[3] and therefore describes it under the old name *Madotheca Cordaeana* (Hüben.) Dumort.[4] In order to avoid the publication of a new combination, Dumortier's name will be employed in the present paper. *M. Cordaeana* is especially at home on stones and rocks along mountain brooks. In such localities it is more or less subject to inundation, but in dry seasons may be exposed to the air for considerable periods. In very shady places it sometimes grows on trees close to the base. Müller comments on the variability of the species, due to environmental conditions, and notes its occurrence in North America, northern Africa, and western Asia, as well as in Europe. In the writer's opinion, however, the records not only from New England but from other parts of eastern North America are based on incorrect determinations, as will be shown below.

In general appearance *M. Cordaeana* resembles *P. pinnata* very

[1] Bull. Torrey Club **24**: 519. 1897.
[2] Rabenhorst's Kryptogamen-Flora **6**[2]: 585. 1915.
[3] Hepat. Germ. 291. 1834.
[4] Recueil d'obs. sur les Jung. 11. 1835.

strongly although its relationships with *P. platyphylla* are perhaps closer. The stems are pinnate or sparingly bipinnate, and the shoot-system on account of the regularity of the branching may assume a fern-like form. This, however, is always less marked than in typical specimens of *P. platyphylla*, and in some cases, especially in drier situations, the branching may be very irregular.

The lobes, lobules, and underleaves differ from those of *P. pinnata* in being usually more or less dentate. The dentation, in fact, although not to be compared with that of the European *P. laevigata* (Schrad.) Lindb. in its typical forms, is commonly more marked than in *P. platyphylla* and its immediate allies, and often helps in determining sterile specimens of *M. Cordaeana*. Taking up the lobes (of the stem-leaves) more in detail they are found to be ovate and rounded at the apex, much as in *P. platyphylla*. In some cases they are not attached to the lobule at all, no keel being present. In other cases an extremely short keel can be demonstrated. Whether a keel is developed or not the lobe is usually distinctly dilated at the carinal base (as it may be called) and may therefore be described as cordate; at the dorsal base the cordate condition is much less frequent, the lobe in most cases gradually narrowing into a short decurrent portion. The teeth of the lobe are much like those of *P. platyphylla* but tend to be sharper, more distinct and more numerous.

The lobules afford some of the most distinctive characters of the species. They are usually much smaller than in *P. platyphylla* and are ovate to lanceolate in form, the apex varying from obtusely pointed to acute. On branch-leaves the apices may even be acuminate. The margins of the lobules are often irregularly revolute in places, the whole lobule being thus variously contorted or crispate. The line of attachment is sharply arched and the inner edge is usually twice or three times as long as the outer, so that the decurrence is very evident. Sometimes, when no keel is present, the outer edge extends farther backward than the lobe in the form of a narrow wing, but this is never so long as the inner edge. Marginal teeth or cilia are restricted for the most part to the decurrent portions. They are exceedingly variable in number, in form, and in size, but are usually more in evidence than in the lobules of *P. platyphylla*.

The leaf-cells average about 30 μ in the middle of the lobe and are therefore a trifle larger than in typical forms of *P. platyphylla* and considerably larger than in *P. pinnata*. They have thin walls and small

but distinct trigones. The underleaves are even more decurrent than in *P. platyphylla* and the decurrent portions tend to be more strongly toothed. In other respects the underleaves are much the same in the two species, although in *M. Cordaeana* they are distinctly narrower, being only a little wider than the stem.

The female branches, which bear a single pair of bracts, sometimes arise directly from the stem and sometimes from a primary branch. In most cases, especially when the branch springs directly from the stem the contrast in size between the bracts is very marked, the inner bract being much larger than the outer. In the outer bract the lobule is narrower than the lobe but almost equals it in length; in the inner bract the lobe tends to be longer and broader than the lobule, although it is always distinctly smaller than the lobes of ordinary leaves. With respect to the apices of the lobes and lobules there is much variety. The lobe of the inner bract, however, is usually rounded at the apex, while the lobe of the outer bract and the lobules of both bracts are usually more or less sharply pointed. The bracteole is much the same as in related species. Both bracts and bracteole are variously toothed, the teeth varying from slightly projecting cells to cilia or broader teeth two to four cells long. The teeth are irregularly scattered but tend to be closer together in the basal regions, where they sometimes show vestiges of hyaline papillae.

The perianth is especially remarkable on account of the character of its mouth. In the other North American species of *Porella* the mouth is variously ciliate; in *M. Cordaeana* it is subentire or vaguely crenulate from projecting cells. Sometimes a slight lobing or indistinctly sinuate appearance is present, but even then the mouth is very different from what is found in other species. The sporophytic characters are much as in *P. platyphylla*, the elaters being bispiral throughout their entire length.

In separating *M. Cordaeana* from *P. platyphylla* the subentire mouth of the perianth, the large inner perichaetial bract, and the small and long-decurrent lobules yield the most helpful characters. The mouth of the perianth will likewise distinguish it from *P. pinnata*, although there is now little danger of confusing these two species even when sterile, on account of the blunt, entire, and transversely attached lobules and underleaves in *P. pinnata*.

Although *M. Cordaeana* is not uncommon from the Rocky Mountains westward very few stations from the eastern part of North

America have been reported. In New England there is one record for Connecticut [1] and one for Vermont.[2] The Connecticut record was based on poorly developed male specimens collected in 1856 by D. C. Eaton in the town of Cheshire; the Vermont record, on a few fragmentary specimens, apparently quite sterile, which were found in 1910 by F. Dobbin in the town of Jamaica. These specimens do not agree with the European and western American material of *M. Cordaeana*. The Connecticut specimens are hardly determinable but clearly belong to the *P. platyphylla*-group. The Vermont specimens agree closely with the plants from Willoughby, which are listed above under *P. platyphylla*, and are therefore included under the same species.

Only two other reports from the region east of the Mississippi are known to the writer. One was based on specimens collected by W. S. Sullivant near Yellow Springs, Ohio [3]; the other on specimens collected by T. P. James at Narrowsville, Bucks County, Pennsylvania.[4] These specimens show rather broad lobules with a short decurrence and very immature perianths, in which the teeth at the mouth are scattered. It seems safe to refer them to *P. platyphylla*, as is done above. Two records made by the writer, one from Stair Portage, Minnesota (*MacMillan, Lyon & Brand 42*),[5] and the other from near Estabrook, Platte Canyon, Colorado (*J. M. Holzinger*),[6] seem to be equally open to criticism. The specimens in both cases should be referred to the *P. platyphylla*-group and probably represent a poorly developed form of *P. platyphylla* itself; unfortunately it is not possible to reach a positive conclusion.

According to the statements just made the occurrence of *M. Cordaeana* in eastern North America seems to be improbable. There are other European species, however, which are restricted, in North America, to the Pacific Coast region, so that the distribution of *M. Cordaeana* in this respect is by no means unique.

5. Porella platyphylloidea (Schwein.) Lindb. Hepat. Utveckl. 20. 1877 (as *Porella platyphylloides*). *Jungermannia platyphylloidea*

[1] See Howe, Bull. Torrey Club **24**: 520. 1897.

[2] Rhodora **14**: 18. 1912.

[3] Distributed by Austin in Hep. Bor.-Amer. *91b*. 1873. The habitat is given on the label as follows: "On shaded rocks, near Yellow Springs, Ohio, *Sullivant;* also in California, *Bolander*." In the writer's set the specimens are unlike any form of *Porella* known from California and doubtless represent Sullivant's plants.

[4] See Porter, Cat. Bry. and Pterid. Pennsylvania 8. 1904.

[5] Minnesota Bot. Stud. **3**: 144. 1903.

[6] Bryologist **18**: 47. 1915.

Schwein. Spec. Fl. Am. Sept. Crypt. 9. 1821. *Madotheca platyphylloidea* Dumort. Recueil d'Obs. sur les Jung. 11. 1835. *Madotheca Jackii* Schiffn. Lotos **48**: 348. 1900. *Porella Jackii* C. Jensen, Danmarks Mosser **1**: 240. 1915. [Text figs. 14–40].

On rocks and trunks of trees. Maine: Auburn (*E. D. Merrill 8*); Mt. Desert Island (*E. L. Rand*); vicinity of Schoodic Lake, Piscataquis County (*A. W. E.*); Bristol and Madison (*E. B. Chamberlain 1344, 1503*); Hebron (*J. A. Allen*); Southwest Harbor (*S. A. Linsey*); Pleasant Ridge Township, Somerset County (*E. B. Chamberlain 3287*); Farmington (*J. F. Collins 1173*); near Prospect Harbor (*A. R. Northrop*). New Hampshire: Crawford Notch (*E. Faxon*); Jackson and Franconia Notch (*A. W. E.*); Madison (*H. H. Bartlett 1250, 1251*); White Mountains ("*E. T. 7*"). Vermont: Willoughby (*A. Lorenz*); Leffert's Mills, Chittenden County (*C. M. Cooke, Jr.*); Bolton (*A. W. E.*); Newfane (*M. A. Howe*, distributed in Amer. Hep. *87*, as *M. platyphylla*). Massachusetts: Dedham and Brookline (*E. Faxon*); West Newbury (*C. C. Haynes*); Woods Hole (*A. W. E.*); Brewster (*F. S. Collins*). Rhode Island: Providence and North Kingston (*J. F. Collins 599, 798*); Chepacket (*G. W. Burlingame 207*). Connecticut: Hamden (1858), New Haven, Danbury, Bethany and East Haven (*D. C. Eaton*); Kent, Ledyard, Hamden, Orange, West Hartford, Meriden and Salisbury (*A. W. E.*); Plainfield (*J. L. Sheldon*); Stafford, Portland, North Haven, Bolton and Vernon (*G. E. Nichols*); Southington ((*E. B. Chamberlain 1437*); Redding (*C. C. Haynes*); Killingworth (*F. W. Hall*); Canterbury (*S. B. Hadley*); Portland and Glastonbury (*F. Wilson*); East Lyme (*C. B. Graves*); Durham (*A. Lorenz*). To give a further idea of the distribution of the species in North America the following stations outside of New England may be given. Nova Scotia: near Indian Brook and in the valley of the Barrasois, Cape Breton (*G. E. Nichols 42, 65, 1545*); Kentville (*H. B. Bailey*); Big Intervale and Baddeck, Cape Breton (*J. Macoun 55, 58*); near Pictou (*Howe & Lang 584*); near Yarmouth (*J. Macoun 24*); Sandy Cove (*J. D. Lowe 22*). Ontario: Ottawa (*J. Macoun*, distributed in Can. Hep. 9, as *P. platyphylla*); Algonquin Park (*J. Macoun 135*); Owen Sound (*Mrs. Roy*). New York: Chittenago and Clarkson (*D. C. Eaton*, 1855); Yonkers (*E. C. Howe*); Murray Island, Jefferson County (*Robinson & Maxon 106*); Mt. Colburn (*E. G. Britton 24*), somewhat doubtful; Undercliff (*C. C. Haynes 330*); Onteora (*A. M. Vail 3*); Bear's Head, Sand Lake (*S. H.*

Burnham 2). Pennsylvania: Erie (*L. G. Olmstead*, 1843); Glen Riddle and Moylan, Delaware County (*A. F. K. Krout*), doubtful; near Conewago, mouth of the Tucquan, near Safe Harbor and near Penryn (*J. K. Small 21, 23, 7, 20, 11*); Sayre (*W. C. Barbour 8*). Ohio: Colombus (*W. S. Sullivant*, 1842); Fairfield County (*E. C. Miller*). Kentucky: Berea (*N. L. T. Nelson 33*). Maryland and District of Columbia: near Washington (*J. M. Holzinger*); High Island (*F. H. Knowlton*). Virginia: Hungry Hollow (Smyth County), McMillan's Cave (near Marion), Brushy Mountain and Holston River (*J. K. Small 44, 71, 85*); Marion, Dickey's Creek, Pine Mountain, White Top summit, and Holston River (*E. G. Britton & A. M. Vail 81-84, 110-115, 33, 128, 58*). West Virginia: Morgantown and Beaver Spring (*C. F. Millspaugh 1291, 1292, 1530*); Cheat Bridge (*J. L. Sheldon 2519*). North Carolina: Salem (*Schweinitz*, type of *Jungermannia platyphylloidea*); Hendersonville (*A. M. Smith*); Blowing Rock, Aunt Sallie Ridge and Grandfather Mountain (*J. K. Small 40, 41, 35, 36*). Georgia: Athens (*R. M. Harper 59a*); Stone Mountain (*J. K. Small 95, 98, 109*); near Thompson, McDuffie County (*H. H. Bartlett 917*). Florida: West Florida (*A. W. Chapman*). Indiana: near Greencastle (*L. M. Underwood*). Wisconsin: Gordon, Douglas County (*C. H. Conklin 157*); near Mason, Lake Superior region (*L. S. Cheney 5166*). Minnesota: Knife River and Albert, St. Louis County (*G. H. Conklin 841, 922*); Old Iron Trail (*J. M. Holzinger*). Missouri: St. Louis (*T. Drummond*); Horine, Cliff Cave, Creve Coeur Lake and Chadwick (*N. L. T. Nelson 770½, 820, CC, 1616, 15*); Silver Mines, Iron County (*C. Russell 4*). New Mexico: Mogollon Mountains, Socorso County (*E. O. Wooton*); Eagle Creek, Lincoln County (*E. O. Wooton*), doubtful; West Fork of the Gila River (*O. B. Metcalfe 490*). A number of these stations have already been recorded under the name *P. platyphylla*, and the specimens from Jackson, New Hampshire, have been figured under this name by the writer.[1] The specimens distributed by Austin (Hep. Bor.-Amer. *89, 90*, as *Madotheca platyphylla* and *M. platyphylla* var.) should also be referred to *P. platyphylloidea;* they were probably collected in New Jersey although this fact is not stated on the labels. The writer has seen no specimens from Mexico. In Europe Müller gives the species a continental distribution, citing specimens from Germany, Austria and northern Italy only.

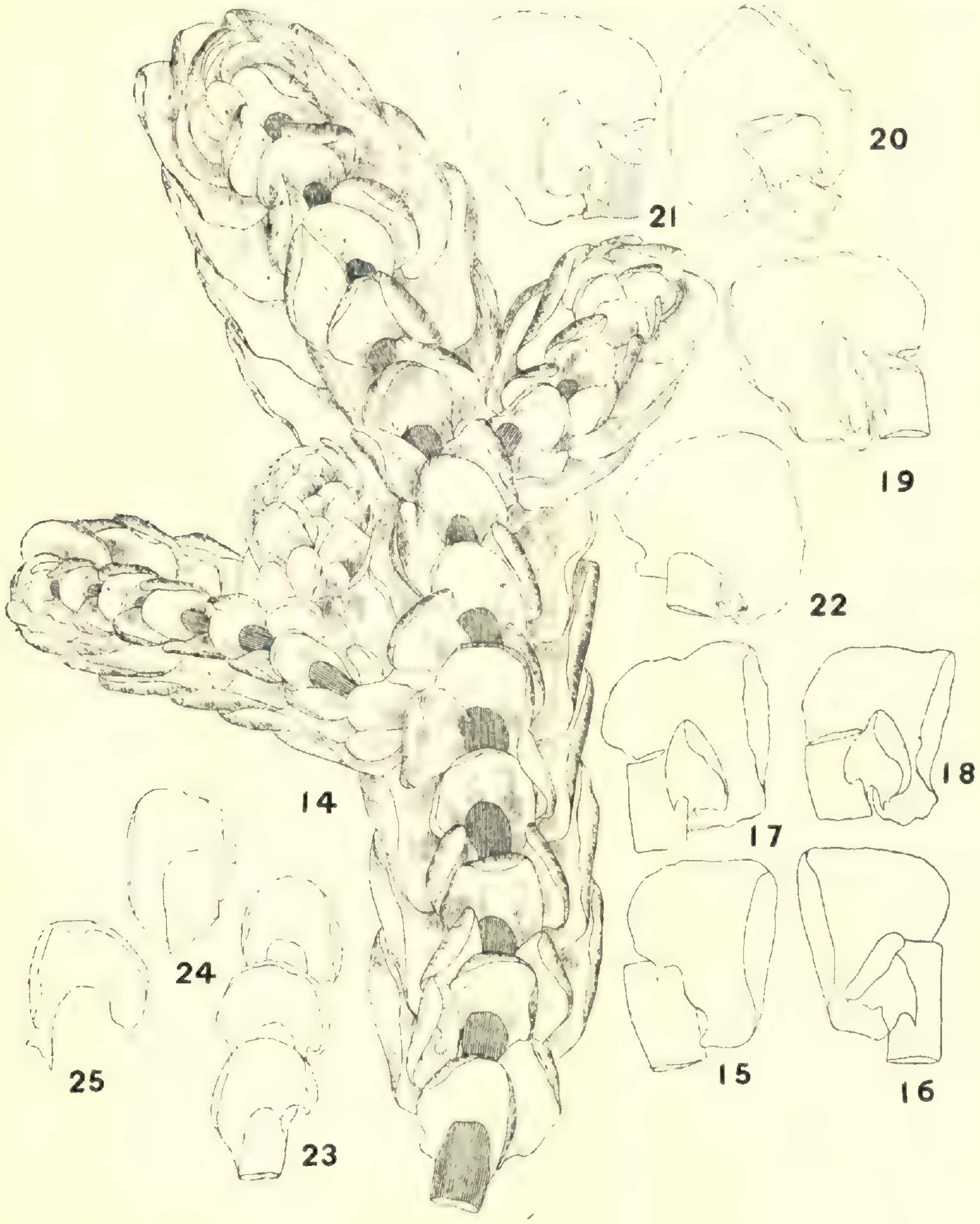
[1] Plant World **2**: *pl. 5*. 1899.

In the account just given of *P. platyphylla* the history of *P. platyphylloidea* is likewise briefly treated. When Schiffner proposed *M. Jackii* as a new species he stated that it differed from *M. platyphylloidea* in its simply pinnate shoots and slightly larger cells, the North American species being described as closely bipinnate. Müller considers these differences of but slight importance and was, moreover, unable to confirm them in his study of authentic specimens of the two species in question. He therefore reduced *M. Jackii* to synonymy and the writer, from a study of European specimens cited by Müller, sees every reason for following his example.

In *P. platyphylloidea*, according to Müller's accounts, the plants are somewhat more robust than in *M. platyphylla*, and the secondary stems are usually only once-pinnate with branches of variable length, the shoot-system thus acquiring an irregular contour; the lobes of the leaves are closely imbricated and suborbicular (usually as broad as long or even broader), the base being crispate and auriculate, the apex broadly revolute, and the margin practically entire; the lobules are about twice as wide as the stem, broadly ovate, broadly rounded at the apex, shortly or not at all decurrent, and slightly revolute along the margin; the leaf-cells average 25 μ in diameter in the middle of the lobe, and the development of the trigones varies according to the environment; the underleaves are of about the same width as the lobules, their outline is suborbicular, and they are shortly decurrent on both sides, the decurrent portions sometimes bearing a few small and scattered teeth, while the rest of the margin is entire and sometimes revolute; the perichaetial bracts, which are reduced to a single pair as in *P. platyphylla*, are smaller than the leaves, the lobe is elongated-ovate and entire, and the lobule is only one-third as large as the lobe, ovate in form, rounded at the apex, and entire, or indistinctly dentate; the perichaetial bracteole in broadly oval, entire or sparingly toothed in the basal region; the perianth is ovate in outline, narrowed toward the two-lipped mouth and shortly dentate or (in Schiffner's words) densely ciliated with cilia one to five cells long. The capsules split as in *P. platyphylla* and the spores average about 46 μ (according to Schiffner); the elaters are mostly 9–10 μ in diameter and usually show a single spiral band throughout their length; in some cases two spiral bands are present in the middle of the elater but only one extends to each end.

Since *P. platyphylloidea* is the commonest species of *Porella* in

eastern North America the writer has had abundant material for study. The North American specimens have been carefully compared with European material. A few slight deviations from the



Figs. 14–25. PORELLA PLATYPHYLLOIDEA (Schwein) Lindb.

14. Branch bearing a male inflorescence and two sterile branches, ventral view. 15. A leaf dorsal view. 16–21. Leaves, ventral view. 22. A leaf at the base of a branch. 23–25. Underleaves. All magnified about 14 times. The figures are a reproduction of those by Gottsche, distributed with Gottsche and Rabenhorst's Hepaticae europaeae *372*. They were drawn from an authentic North American specimen of *Jungermannia platyphylloidea* Schwein. in the Lindenberg herbarium.

published accounts of the species have been noted and these will be considered in order. The differences between *P. platyphylloidea* and *P. platyphylla* will then be discussed.

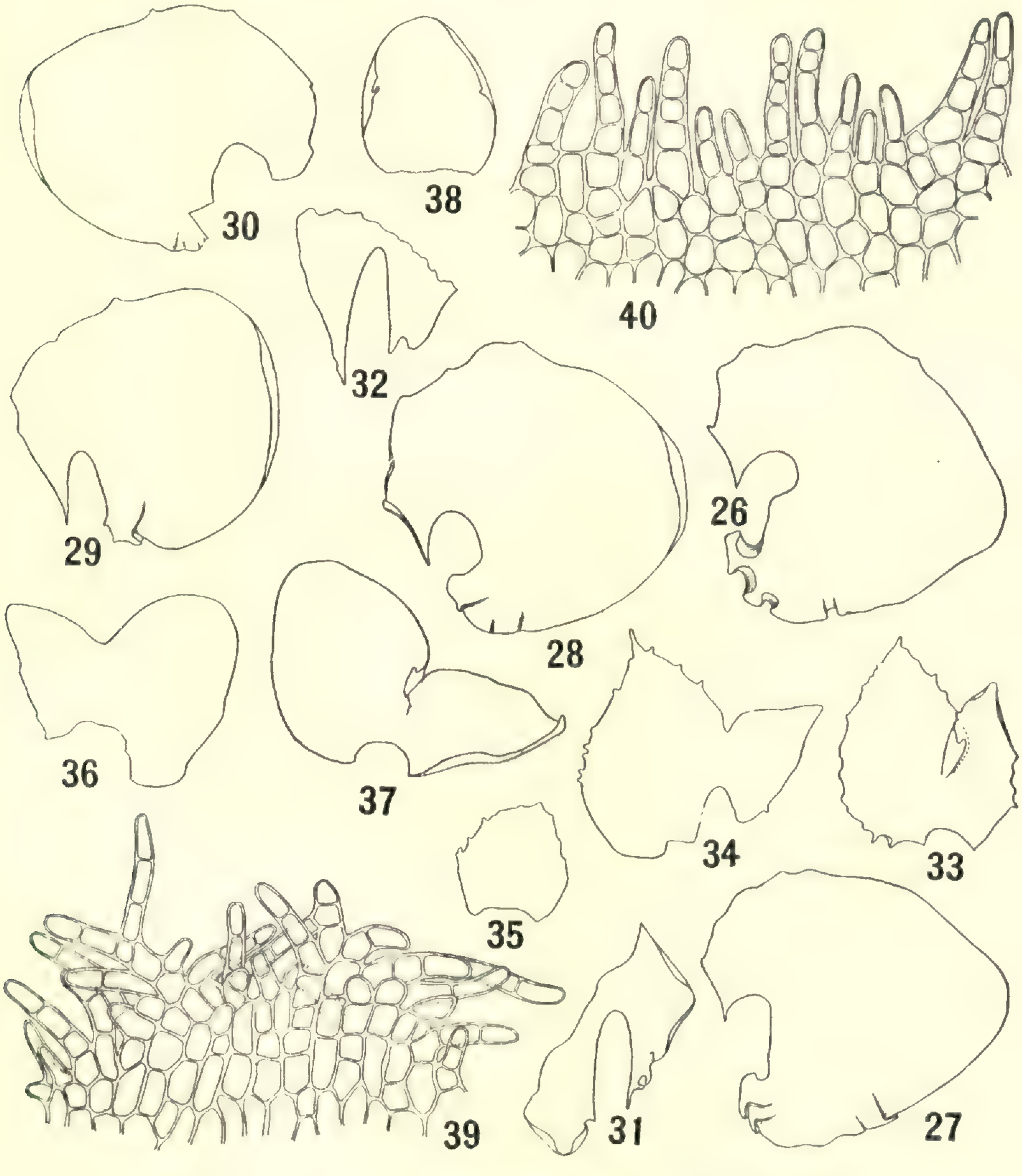
Although the lobes (of the stem-leaves) are usually orbicular and are sometimes even broader than long, as shown in Figs. 16–21, 26–29, it is not unusual for some of the leaves to be longer than broad and thus to approach in form the typical leaves of *P. platyphylla*, a condition shown in Fig. 30. At the junction with the keel the cordate expansion is strongly developed and tends to be conspicuously crispate or irregularly folded. On the other side of the lobe, however, although a cordate expansion may be present, as shown in Fig. 30, it is much more usual for the lobe to narrow gradually and show a short decurrence, as shown in Figs. 15, 26–29. Marginal teeth are often present, just as they are in *P. platyphylla*, and tend if anything to be more pronounced, but they are essentially the same in character.

In typical material of *P. platyphylloidea* the lobules are about as wide as the underleaves and have broad rounded apices and narrowly revolute margins. Unfortunately this typical condition is not always realized, a fact clearly brought out by Gottsche's figures of the species, which were drawn from an authentic American specimen in the Lindenberg herbarium. These figures were issued with No. 372 of Gottsche and Rabenhorst's Hepaticae europaeae, and are here reproduced as Figs. 14–25. It will be noted that many of the lobules shown are narrower than the underleaves, that some of them are narrowed toward the apex, and that the outer side only is recurved. The objection might perhaps be brought forward that Gottsche's figure was drawn from a male individual, and that a plant often produced androecia before it had reached the full luxuriance of which it was capable.[1] The writer, however, has observed female plants, bearing mature sporophytes with unispiral elaters, in which the lobules were fully as narrow as those in Gottsche's figures and essentially like them in other respects. Among plants of this character the Virginia specimens collected by J. K. Small at the Falls of Holston River (No. 85) might be especially mentioned, although similar specimens have been found in other localities. It is clear, therefore, that the characters drawn from the form and relative size of the lobule must be interpreted with discretion. The remarks made under *P. platyphylla* with regard to the degree of decurrence and the occasional presence of teeth near

[1] Compare Goebel, Organographie, 2d ed. 142. 1913.

the base of the lobule would apply equally well to *P. platyphylloidea*, although the tendency to bear teeth is rather more pronounced in the latter species.

The writer can add nothing of importance to the published descrip-



Figs. 26–40. Porella platyphylloidea (Schwein.) Lindb.

26–30. Lobes of stem leaves, × 15. 31, 32. Lines of attachment of lobules, 31 showing keel on left hand side, and 32, on right hand side, × 35. 33–35. Bracts and bracteole from a single involucre, × 25. 36–38. Bracts and bracteole from another involucre, × 25. 39, 40. Teeth from mouths of perianths, × 200. Figs 26, 27, 31, 33–35, 39 were drawn from a specimen collected on Mt. Carmel, Hamden, Connecticut, by the writer; Figs. 28–30, 32, from a specimen of *Madotheca Jackii* Schiffn., collected at Salem in Baden, Germany, by J. B. Jack and distributed by Gottsche & Rabenhorst, Hep. eur. *140;* Figs. 36–38, from another specimen collected at Salem in Baden, Germany, by J. B. Jack; Fig. 40, from a specimen collected at Madison, New Hampshire, by H. H. Bartlett, *1250*.

tions of the leaf-cells and the underleaves (see Figs. 14, 23–25). In the case of the female inflorescence, however, a few remarks may be in place. Although the perichaetial bracts are almost invariably reduced to a single pair, a second pair is occasionally developed. When this is the case the pair next to the perianth is essentially the same as when a single pair is present. Müller implies that there is a much greater discrepancy in size between the lobe and lobule than in *P. platyphylla*, but this idea is not borne out by the writer's observations. As a matter of fact the bracts (Figs. 33, 34, 36, 37) are much the same as in *P. platyphylla* and are subject to the same variations in the character of the apex and the degree of the marginal dentation; sometimes, indeed, the apex is tipped with an apiculum (Figs. 33, 34). In the case of the bracteole teeth are occasionally present in the upper part as well as in the basal region (Figs. 35, 38).

The mouth of the perianth is more contracted in *P. platyphylloidea* than in *P. platyphylla* and is densely ciliate. The cilia are usually one cell wide and vary from one to five or more cells in length (as Schiffner states); sometimes compound cilia are present with secondary cilia along their sides, but simple unbranched cilia are the rule. The cilia are sometimes straight as in Fig. 40 but it is much more usual for them to be variously contorted as in Fig. 39. Projecting cells in the neighborhood of the mouth are sometimes present as in the North American specimens of *P. platyphylla* (see Fig. 39).

In studying a large series of capsules of *P. platyphylloidea* the elaters have shown for the most part a single spiral throughout their length. Elaters with two spirals in the middle portion have, nevertheless, been repeatedly observed, and in some capsules a rather high percentage of the elaters have been of this type. In no case, however, has an elater with two spirals throughout its entire length been noted, so that in the elaters at least the differences between *P. platyphylla* and *P. platyphylloidea* are definite and constant. In distinguishing the two species the most trustworthy differences are, in fact, those drawn from the elaters. Boulay [1] comments on the difficulty of using sporophytic characters in the genus at all on account of the habitual sterility of material, but this difficulty does not detract in any way from the importance of such characters.

In the absence of mature capsules the mouth of the perianth, even when undeveloped perianths are the only ones available, should be

[1] Musc. de la France **2**: 18. 1904.

examined. This can best be done by dissecting off the upper part of the perianth, splitting it, and spreading it out flat, and care must be taken in making sure that the teeth or cilia at the mouth are still intact. The study of old and disintegrated perianths has led to many errors. The teeth or cilia yield characters which can be employed with safety. In *P. platyphylla* they are scattered; in *P. platyphylloidea*, densely crowded. It has already been noted that in North American specimens of *P. platyphylla* the teeth are more numerous than in the European material; they are never so numerous, however, as in *P. platyphylloidea* and do not present the appearance of being everywhere close together.

If neither capsules nor perianths are present the much less satisfactory characters drawn from the habit of the plants and from the leaves are still available. If the specimens to be determined are robust, if the stems are irregularly pinnate, if the lobes of the stem-leaves are as broad as long and distinctly crispate at the base, and if the lobules are about as wide as the underleaves and rounded at the broad apex, there can be little question that the plants should be referred to *P. platyphylloidea*. If, on the other hand, the specimens are of a medium size, if the stems are regularly bipinnate, if the lobes of the stem-leaves are longer than broad and scarcely or not at all crispate at the base, and if the lobules are distinctly narrower than the underleaves and show a tapering toward the apex, a determination as *P. platyphylla* is indicated. Unfortunately there are cases where the vegetative characters by themselves can hardly lead to a positive decision. This is true not only of poorly developed specimens but also of well-developed specimens in which the distinctive characters just given are differently grouped; where, for example, an irregularly pinnate stem is associated with narrow lobules or with lobes which are distinctly longer than broad. Male specimens seem to be especially troublesome in this respect and sometimes fail to show the characters of the species clearly when female plants growing with them are typically developed. In the writer's opinion Schiffner's var. *subsquarrosa* [1] of *P. platyphylla*, based on European material, includes forms which cannot be determined positively by means of the vegetative characters alone; and very similar American specimens are listed above under *P. platyphylloidea* on the basis of perianths and capsules.

It is evident from the remarks just made that *P. platyphylloidea*,

[1] Lotos **48**: 346. 1900.

even if recognized as a valid species, must be regarded as a "kleine Art" in the *P. platyphylla*-group. According to our present knowledge the range of the true *P. platyphylla* is northern rather than southern in North America, but it must be admitted that our knowledge is still incomplete. Perhaps when more is known about the geographical distribution of these two species it may be possible to utilize this knowledge in the determination of doubtful specimens.

Schiffner's *Madotheca Baueri* has as yet been reported from Europe only. The writer has not had access to Schiffner's types but has examined a series of authentic specimens including those in Jack, Leiner & Stizenberger's Kryptogamen Badens *164*, and in Rabenhorst's Hepaticae europaeae *52*, both of which are referred by Müller to *M. Baueri*. No. 164 was collected by F. Himmelseher near Salem in Baden and No. 52 by A. Röse near Schnepfental in Thuringia. The specimens studied agree closely with the published descriptions but indicate that the validity of *M. Baueri* is fully as doubtful as that of *M. platyphylloidea*. The characters emphasized by Schiffner are the following: the large size and irregular branching; the broadly elliptical to almost orbicular lobes; the distant, small, almost plane underleaves, broadly rounded at the apex; the large leaf-cells, averaging about 36 μ near the apex of the lobe; the narrow mouth of the perianth with crowded cilia; and the elaters with one spiral, except in the median portion where two are present. Müller describes the cells in the middle of the lobe as 30–35 μ in diameter, and adds that one or two blunt teeth are borne on the margin of the lobe, that the lobule is long decurrent and often toothed in the decurrent portion, that the perichaetial bracts are shortly and bluntly denticulate throughout, and that the crowded cilia at the mouth of the perianth are three or four cells long. Aside from the features mentioned *M. Baueri* is described as being much like *P. platyphylla*.

The material studied by the writer brings out the fact that many of the differential characters relied upon are subject to great variation. This is particularly true of those drawn from the form and dentation of the leaves. The large leaf-cells afford a character which deserves more weight. The difference in size, when these cells are compared with those of *P. platyphylla* and *P. platyphylloidea*, is usually pronounced, although Müller brings out the fact that in the variety *subsquarrosa* of *M. platyphylla* the cells approach those of *M. Baueri*. In the mouth of the perianth the resemblance to *P. platyphylloidea* is particularly

striking, and, according to the description, the characters drawn from the elaters would indicate a relationship with this species rather than with *P. platyphylla*. Unfortunately the structure of the elaters is not quite so uniform as Schiffner implies. In the single mature capsule examined by the writer (taken from Kryptogamen Badens *164*), some of the elaters agree closely with Schiffner's description; in others, however, the unispiral portions at the ends are very short, and a few elaters are bispiral throughout, the two spirals forming a loop just as in *P. platyphylla*. In its elaters, therefore, *M. Baueri* is intermediate between *P. platyphylloidea* and *P. platyphylla*.

The additions to local state floras, not already mentioned on the preceding pages, are as follows:—

For Maine. *Cephalozia macrostachya*, Round Mountain Lake and vicinity, Franklin County (*A. Lorenz*).

For New Hampshire. *Calypogeia sphagnicola*, Mt. Monadnock (*A. Lorenz*).

For Massachusetts. *Riccia Lescuriana*, Northampton (*A. Lorenz*). *Riccia sorocarpa*, Deerfield (*A. Lorenz*). *Lophozia alpestris* and *Sphenolobus Hellerianus*, Sheffield (*A. Lorenz*). *Lophozia attenuata* and *Sphenolobus minutus*, Mt. Everett, town of Mt. Washington (*A. Lorenz*).

As already noted the New England records for *Scapania gracilis* and *Porella rivularis* and the Vermont record for *Scapania dentata* should be erased. The New Hampshire, Massachusetts and Rhode Island records for *Porella platyphylla*, which were marked in the Revised List with the sign "+," should now be marked with the sign "−." The Massachusetts record for *Grimaldia fragrans*, however, which was marked in the Revised List with the sign "−," may now be marked with the sign "+," the necessary specimens having been collected by A. Lorenz.

The census of New England Hepaticae now stands as follows: Total number of species recorded, 185; number recorded from Maine, 131, for New Hampshire, 138; for Vermont, 120; for Massachusetts, 110; for Connecticut, 141; common to all six states, 59.

Sheffield Scientific School, Yale University.

EXPLANATION OF PLATE.

PORELLA PLATYPHYLLA (L.) Lindb.

1–6. Lobes of stem-leaves, × 15. 7–9. Bracts and bracteole from a single involucre, × 25. 10–14. Teeth from mouths of perianths, × 200. Figs. 1, 2, 7–10 were drawn from a specimen collected near Florence, Italy, by E. Levier, and determined by Schiffner as the typical form of *Madotheca platyphylla;* Fig. 3, from a specimen collected at Fiesole, near Florence, Italy, by E. Levier, and determined by Schiffner as *M. platyphylla* var. *subsquarrosa;* Figs. 4–6, 11, from a specimen collected at Bic, Quebec, by the writer *98;* Fig. 12, from a specimen collected at New Haven, Connecticut, by D. C. Eaton; Fig. 13, from a specimen collected at Vasa, Minnesota, by N. L. T. Nelson *945½;* Fig. 14, from a specimen collected at New Milford, Connecticut, by the writer.

NYMPHAEA MAGNIFICA.— The crimson night-blooming waterlily of India is well known by reason of a century of cultivation in European and American gardens. It was first described in print in Hooker's Paradisus Londinensis. The article is illustrated with two colored plates, one showing the leaf and one the flower. The flower plate bears the date October 1, 1805. This is the day on which the first copy was printed, and is given in accordance with an act of parliament relating to copyrights. Both plates bear the name *Castalia magnifica.* In the text on the second page following the plate, the plant is described as *Castalia magnifica.* As a synonym the name *Nymphaea rubra* Roxb. MSS. is given, and by this name the plant has ever since been known whenever it has been referred to the genus Nymphaea.[1]

There is no doubt, however, that Salisbury was the first to publish a binomial name for the crimson Indian waterlily. According to the International Rules (Art. 35, 37) Roxburgh's manuscript name, first published in synonymy, is not valid. We must, therefore, return to Salisbury's specific name, thus:

Nymphaea magnifica (Salisb.), comb. nov. *Castalia magnifica* Salisb. in Hook. Parad. Lond. i. t. 14 (1805). *N. rubra* Roxb. ex Salisb. l. c. in synon. 1805 et auct. plur.— HENRY S. CONRAD.

[1] In a paper to appear shortly in this journal reasons will be given for holding to the generic names Nymphaea and Nuphar.

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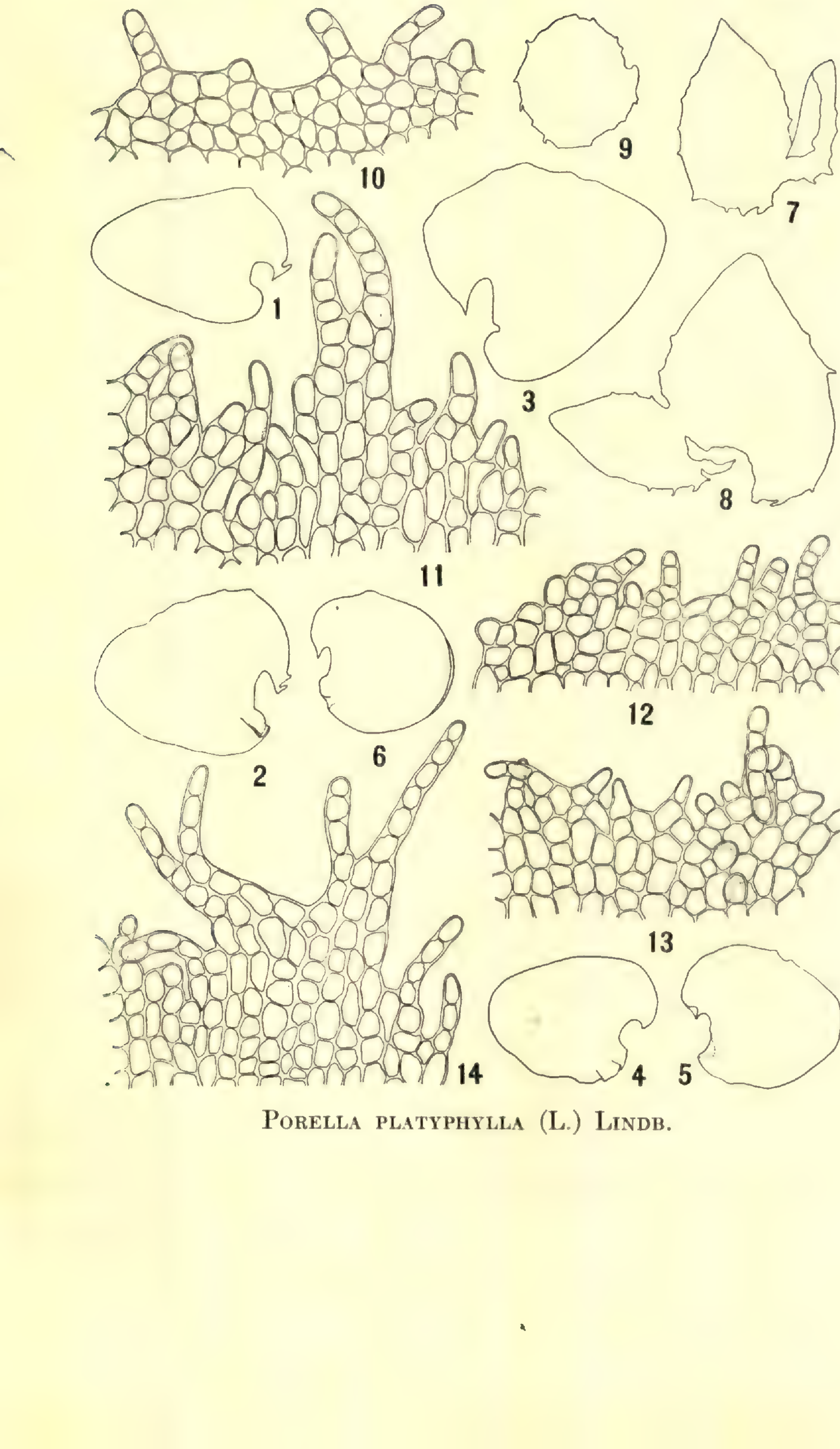

PORELLA PLATYPHYLLA (L.) LINDB.

Rhodora

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A REVISION OF THE NORTH AMERICAN SPECIES OF POTAMOGETON OF THE SECTION COLEOPHYLLI.

Harold St. John.

The genus *Potamogeton* has been the object of much study in Europe and in America, and consequently boasts an abundant literature. Within the last twenty-five years five authors have published monographic treatments [1] of it, all of which are useful to the students of the North American Potamogetons because of the wide dispersal of many of the species. *P. pectinatus*, for instance, one of the species considered in this article, is the most widespread of the genus and, as Bennett points out,[2] is found in all of the six zoölogical regions of the world defined by Wallace: the Palearctic, the Nearctic, the Neotropical, the Ethiopian, the Oriental, and the Australian.

In the introduction to his monograph Morong remarks, "so protean are their forms, so eccentric their action, constantly changing under changed conditions of season and water, that I put forth this treatise with great diffidence, and feel that the subject is very far from being exhausted." Very similar are my feelings concerning this fascinating, difficult genus, but in an attempt to solve some of the imperfectly understood complexes I have given a detailed study to *Potamogeton*

[1] Morong, Naiadaceae of N. Am., Mem. Torr. Bot. Club, iii. no. 2 (1893).
Fryer, Potamogetons of the British Isles (1898–1915).
Fischer, Die bayerischen Potamogetonen und Zanichellien, Ber. Bayer. Bot. Ges. xi. 20–162 (1907).
Ascherson und Graebner, Pflanzenreich, iv. Fam. 11 (1907).
Taylor, N. Amer. Flor. xvii. pt. 1, 14–27 (1909).

[2] Bennett in Fryer l. c., ix.

pectinatus L., *P. filiformis* Pers., and their allies, forming the section *Coleophylli*, and venture to make known my conclusions as to the North American species. The section *Coleophylli* Koch is characterized by the possession of submersed leaves only, which are adnate for some distance at the base with the stipule, forming a clasping sheath. The members of the group as now understood can be distinguished by means of the following key.

A simple notation is used to indicate the collections in which the specimens cited may be found.

(A) Academy of Natural Sciences of Philadelphia.
(C) Canadian Geological Survey.
(H) Gray Herbarium.
(N) New England Botanical Club.
(R) Rocky Mountain Herbarium.
(Y) Eaton Herbarium, Yale University.

A. Leaves auricled at base, stiffly two-ranked, with a cartilaginous, finely and sharply serrate margin.....1. *P. Robbinsii* Oakes.

A′. Leaves not auricled at base, not definitely two-ranked, not serrate.

B. Style slender, incurved, persistent as a beak on the mature fruit.

C. Leaves (except those of the first year's shoot which are coarser and blunt) 0.2–1 mm. broad, acute, taper-pointed; sheaths but slightly thicker than the stem.....2. *P. pectinatus* L.

C′. Leaves 2–4 mm. broad, obtuse or shortly apiculate; the upper short, 1.5–2.5 cm. long; sheaths loose, 2–4 times thicker than the stem. 3. *P. latifolius* (Robbins) Morong.

B′. Style wanting, fruit beakless; leaves retuse, blunt, or often shortly apiculate.

D. Whorls of flowers 5–12, evenly spaced, or the lower somewhat more remote: the upper leaves filiform; primary sheaths swollen, 2–5 times thicker than the stem, bearing short ribbon-like blades. 4. *P. moniliformis* St. John.

D′. Whorls of flowers 2–5, the upper approximate: sheaths tight, all bearing filiform blades.

E. Mature spike elongate, moniliform, 1.5–5 cm. long; verticels mostly remote, the upper 3–12 mm. apart, the lower usually 0.7–2.5 cm. apart.....5. *P. filiformis* Pers.

E′. Mature spike short, 0.5–2.5 cm. long; the upper verticels mostly approximate, the lower approximate or at most 7 mm. apart.

F. Leaves fine, 0.25–0.5 mm. broad, retuse or obtuse.
5a. *P. filiformis* Pers., var. *borealis* (Raf.) St. John.

F′. Leaves coarse, 0.75–2 mm. broad, obtuse or shortly apiculate.
5b. *P. filiformis* Pers., var. *Macounii* Morong.

1. P. Robbinsii Oakes, Hovey's Magaz. vii. 180 (1841).— Stem stout, often freely branching: leaves linear, auricled at base, borne in two ranks and stiffly divergent, 2–8 cm. long, 3–7 mm. wide, those of the inflorescence reduced almost to narrow bracts; the margins cartilaginous, finely and sharply serrate; midrib broad, flanked by many fine secondary nerves; stipules white, many-nerved, soon becoming deeply lacerate: flowering shoots with elongate internodes and much reduced leaves, branching to produce several peduncles 1.5–5 cm. long: spikes short, 7–18 mm. long, loosely flowered, rarely maturing fruit: fruit obliquely obovate, with a sharp central keel and rounded lateral keels, 4 mm. long, 3 mm. wide; sides with a shallow depression; beak subapical, 1 mm. long.— Generally distributed in quiet waters from New Brunswick south to Delaware and west to British Columbia and Oregon.

Maine: pools in the Mattawamkeag River, below Island Falls, Aroostook County, Sept. 25, 1901, *M. L. Fernald* (N); quiet pools in Piscataquis River, Dover, Aug. 27, 1894, *M. L. Fernald* (N); in a muddy pond, Plymouth, 1860, *J. W. Chickering* (H); East Wilton, Valley of the Sandy River, 1894, *Kate Furbish* (N); Haley Pond, Rangely, 1894, *Kate Furbish* (N); Loon Lake, Rangely Lake Region, Aug., 1894, *Kate Furbish* (N); the most abundant plant in the inlet of Lambert Lake, Valley of the St. Croix River, Washington County, Sept. 1, 1908, *M. L. Fernald* (N); in 5–7 feet of water, Biscay Pond, Bristol, Sept. 6, 1898, *E. B. Chamberlain*, no. 822 (N); Torsey Pond, Readfield, Sept., 1892, *Kate Furbish* (N); Messalonskee River, Waterville, Sept. 2, 1898, *M. L. Fernald*, no. 2,725 (N); South Poland, Valley of the Androscoggin River, 1893, *Kate Furbish* (N); Androscoggin Lake, North Leeds, Sept., 1894, *Kate Furbish* (N); West Baldwin, Valley of the Saco River, Sept., 1900, *Kate Furbish* (N). New Hampshire: Forest Lake, Dalton, Aug. 31, 1908, *A. S. Pease*, no. 11,580 (N); Pondicherry Pond, Jefferson, July, 1849, *J. W. Robbins* (A). Vermont: Lake Champlain, Ferrisburg, Aug. 12, 1880, *E. & C. E. Faxon* (H & N); Lake Dunmore, Aug. 31, 1896, *Ezra Brainerd* (H); Lake Bomoseen, Castleton, Oct. 1, 1898, *W. W. Eggleston* (H). Massachusetts: Kenoza Lake, Haverhill, Aug. 10, 1913, *J. R. Lunt* (N); ad Lacum Wenham, *Oakes* (H); Westford, Aug., 1903, *Miss E. F. Fletcher*, no. 2 (H); Hagget's Pond, Andover, Aug. 8, 1903, *A. S. Pease*, no. 2,458 (N); Flax Pond, Lynn, Aug. 22, 1880, *E. & C. E. Faxon* (H & N); Sluice Pond, Lynn, Aug., 1880, *H. A. Young* (N); wet shore of Concord River, Concord, Aug. 5, 1886, *E. S. Hoar* (N); Mystic Pond, Winchester, Aug. 13, 1865, *William Boott* (H); Fresh Pond, Cambridge, July 1865, *Asa Gray* (H), July 25, 1879 and July 27, 1880, *Thomas Morong* (N); Cambridge, *Nuttall* (A); Jamaica Pond, Jamaica Plain, July 13, July 17, July 31, Aug. 10, Aug. 18, Aug. 30, 1880, *E. & C. E. Faxon* (H & N); in a pond, Plymouth, Aug. 26, 1913, *S. N. F. Sanford* (N); Lake Quinsigamond, Worcester, July 29, 1864, *J. W. Robbins* (H); ex canali ad Uxbridge, 1849, *J. W. Robbins* (H);

Harmon Pond, New Marlboro, June 29, 1912, *R. Hoffmann* (N); quiet water, Lake Garfield, Monterey, July 12, 1912, *R. Hoffmann* (N). RHODE ISLAND: Smithfield, May, 1845, *G. Thurber* (H); pond in a quarry, Lime Rock, Lincoln, Oct. 19, 1913, *H. St. John*, no. 900 (N). CONNECTICUT: shallow water, Dog Pond, Goshen, Aug. 24, 1913, *C. H. Bissell & C. A. Weatherby* (N); in Pistapaug Pond, Durham, Sept. 9, 1913, *A. E. Blewitt*, no. 1,681 (N); Hamlin's Pond, Southington, July 29, 1901, *C. H. Bissell* (H); ex Park River, Hartford, mense Junio florentem, 1845, *J. W. Robbins* (H); Lake Saltonstall, New Haven, 1857, *D. C. Eaton* (H). NEW ENGLAND: *E. Tuckerman* (H). NEW JERSEY: Budd's Lake, Morris County, Aug. 6, 1869, *T. C. Porter* (H); Morris Pond, July 20, 1907, *C. S. Williamson* (A); Swartzwood Lake, Aug. 31, 1904, *C. S. Williamson* (A no. 511,111). PENNSYLVANIA: above the forks of Neshaminy Creek, Bucks County, *Dr. Martindale* (A); in Lehigh River, Bethlehem, *Schweinitz* (A); Susquehanna River, Harrisburg, Aug. 26, 1863, *T. C. Porter* (A & H); Susquehanna below Columbia, Lancaster County, Aug. 31, 1863, *T. C. Porter* (H). DELAWARE: canal, Delaware City, Sept. 7, 1896, *A. Commons*, no. 18 (A & H). ONTARIO: Ottawa River near Brittania, Aug. 21, 1911 (C. no. 85,540); Plevna, July 29, 1902, *J. Fowler* (H); Cockburn Island, Lake Huron, *T. Bell* (H). INDIANA: Wolf Lake, Sept. 3, 1900, *Agnes Chase*, no. 1,463 (A). WYOMING: Heart Lake, Yellowstone Park, Hayden Expedition, 1878, *C. Richardson* (H). IDAHO: south end of Lake Coeur d'Alene, July 17, 1898, *L. F. Henderson*, no. 4,613 (H). OREGON: Strawberry Lake, 2,330 m. altitude, Blue Mountains, Sept. 8, 1910, *Wm. C. Cusick*, no. 3,622 (H); without definite locality, 1871, *Elihu Hall*, no. 495 (H). WASHINGTON: abundant in shallow water, Lake Cushman, Mason County, Aug., 1895, *C. V. Piper*, no. 2,231 (H); under two feet of water, Lake Cushman, July 6, 1890, *L. F. Henderson*, no. 1,861 (H). BRITISH COLUMBIA: Sumas River, Vancouver Island, Aug. 13, 1887, *John Macoun* (C no. 4,154); Dick's Lake, Sooke, Vancouver Island, Aug. 2, 1893, *John Macoun* (C no. 4,369).

2. P. PECTINATUS L., Sp. Pl. 127 (1753).[1] *P. interruptus* Kit. in Schult. Österr. Fl. ed. 2, i. 328 (1814). *P. flabellatus* Bab., Man. Brit. Bot. ed. 3, 343 (1851). *P. columbianus* Suksdorf, Deutsche Bot. Monatschr. xix. 92 (1901).— Rootstock creeping, freely branched, about 1 mm. thick, bearing terminal thickened bulblets: stem filiform, about 1 mm. thick, sparsely branched near the base, but towards the summit closely and abundantly forking: leaves 3–15 cm. long, bristle-like, mostly 0.25–1 mm. broad (those of the first year's shoot often broader and blunt), tapering to an acute tip, with 1–3 nerves; sheaths 2–5 cm. long, only slightly thicker than the stem, the sides often bleached to a chalky-white color; the ligule less than half the length of

[1] No attempt has been made to include full synonymy, which can be found especially in Ascherson & Graebner, l. c. Only such names as have been open to question in America and which now seem satisfactorily disposed of are given as synonyms.

the sheath: peduncles single, of variable length, bearing 2–5 often widely and unequally spaced whorls of flowers: fruit obliquely obovate, greenish or yellowish, 2.5–4 mm. long, 2–3 mm. broad, with a slender incurved style persistent as a beak on the mature fruit.—Widely distributed in brackish, alkaline, or sometimes fresh waters from eastern Newfoundland to British Columbia and southward, also in temperate and tropical regions of the rest of the world.

NEWFOUNDLAND: shallow tidal pools in salt marsh, Norris Arm, Valley of Exploits River, Aug. 21, 1911, *M. L. Fernald & K. M. Wiegand*, no. 4,494 (H); brackish or saline pool, Carboniferous area, Stephenville Crossing, head of Bay St. George, Aug. 14, 1910, *M. L. Fernald & K. M. Wiegand*, no. 2,461 (H); brackish pond, Port au Port ("The Gravels"), Aug. 15, 1910, *M. L. Fernald, K. M. Wiegand & J. Kittredge Jr.*, no. 2,462 (H). QUEBEC: pool in a brackish marsh, River Etamamiou, Charnay, Saguenay County, Aug. 28, 1915, *Harold St. John* (C): brackish pool near the mouth of Matane River, Matane, Gaspé County, Aug. 6, 1904, *F. F. Forbes* (H & C); tidal flats of the St. John (or Douglastown) River, Gaspé County, Aug. 23, 1904, *J. F. Collins, M. L. Fernald & A. S. Pease* (H). MAGDALEN ISLANDS: shallow ponds among the sand hills between East Cape and East Point, Coffin Island, Aug. 17, 1912, *M. L. Fernald, B. Long & H. St. John*, no. 6,790 (H); Hospital Pond, Grindstone Island, July 18, 1912, *M. L. Fernald, E. B. Bartram, B. Long & H. St. John*, no. 6,791 (H): deadwater of stream flowing into pond southwest of Étang du Nord wharf, Grindstone Island, July 25, 1912, *M. L. Fernald, E. B. Bartram, B. Long & H. St. John*, no. 6,793 (H); shallow water near the margins of brackish ponds southwest of Étang du Nord village, Grindstone Island, Aug. 15, 1912, *M. L. Fernald, B. Long & H. St. John*, no. 6,794 (H). PRINCE EDWARD ISLAND: abundant in a broad band near margin of North Lake, Aug. 24, 1912, *M. L. Fernald, B. Long & H. St. John*, no. 6,788 (H); Black Pond, July 28, 1912, *M. L. Fernald, E. B. Bartram, B. Long & H. St. John*, no. 6,787 (H); Lower Sea Cow Pond, Aug. 6, 1912, *M. L. Fernald, B. Long & H. St. John*, no. 6,789 (H). NOVA SCOTIA: salt pond, Baddeck, Cape Breton, 1883, *Dr. Burgess* (Y); salt ponds, Baddeck, Cape Breton, July 18, 1883, *J. Macoun* (C no. 4,150); salt marshes, Grand Narrows, Cape Breton, July 27, 1898, *J. Macoun* (C no. 20,752); brackish ponds, Sable Island, Aug. 5, 1900, *J. Macoun* (C no. 22,072); edge of brackish pond, Sable Island, Aug. 27, 1913, *H. St. John*, no. 1,126 (H). NEW BRUNSWICK: brackish pools at mouth of Tête-à-Gouche River, Bathurst, July 24, 1902, *E. F. Williams & M. L. Fernald* (H); cove in St. John River, Ingleside, Westfield, Aug. 7, 1909, *M. L. Fernald*, no. 1,616 (H). MAINE: near margin of Beau Lac, Saint Francis River, Aroostook County, Aug. 14, 1902, *W. W. Eggleston & M. L. Fernald* (H); brackish pools, Winnegance Creek, Phippsburg, Sagadahoc County, Aug. 23, 1909, *M. L. Fernald*, no. 1,613 (N). NEW HAMPSHIRE: Connecticut River, Hanover, July,

1876, *H. G. Jesup* (H). VERMONT: Lake Champlain, Aug. 7, 1880, *E. & C. E. Faxon* (H); mouth of Lewis Creek, Lake Champlain, Aug. 17, 1880, *E. & C. E. Faxon* (H & N); in Missiquoi River, Sheldon, Sept. 11, 1909, *A. E. Blewitt*, no. 2,136 (N). MASSACHUSETTS: Sachacha Pond, Nantucket, July 13, 1886, *F. S. Collins* (N); brackish water at south end of pond near Long Pond or in Long Pond, Nantucket, *W. Oakes* (H); fruit piled on shore of Coskata Pond, Nantucket, July 14, 1887, *W. Deane & T. Morong* (H); Nantucket, *L. L. Dame* (N); Sesachacha Pond, Nantucket, July 14, 1888, *Dame, Jenks & Swan* (N & Y); Siasconset, Nantucket, July 13, 1886, *F. S. Collins* (Y); in aquis minus salsis, in insula Martha's Vineyard, Aug. 17, 1865, *J. W. Robbins* (A); Mill pond, Mill River, New Marlboro, July 24, 1912, *R. Hoffmann* (N); Nigger Pond, and Housatonic River, Stockbridge, Aug. 20, 1902, *R. Hoffmann* (N). RHODE ISLAND: ex aqua salsa lacuna ad maris littus prope Newport, 1849, *J. W. Robbins* (H); brackish ditches, Newport, July 20, 1881, *Frank Tweedy* (Y); Chagum Pond, Block Island, Aug. 22, 1913, *M. L. Fernald, F. W. Hunnewell 2nd. & B. Long*, no. 8,453 (H); washed ashore, sandy and gravelly shores of Chagum Pond, Block Island, Sept. 13, 1913, *M. L. Fernald, B. Long & G. S. Torrey*, no. 8,452 (A & N). CONNECTICUT: Housatonic River, Oxford, Aug. 7, 1886, *E. B. Harger* (H); landlocked ditches and pools on salt meadows, abundant, Stratford, Sept. 5, 1902, *E. H. Eames* (H); abundantly filling ditches on salt meadows, in brackish water, Stratford, July 24, 1903, *E. H. Eames* (N); Hartford, 1857, *D. C. Eaton* (Y). NEW YORK: Western part, *E. Tuckerman* (H & Y); Chemung River, Elmira, Aug. 21, 1900, *W. C. Barbour*, no. 877 (R); Lake Seneca, Aug. 14, 1884, *T. Morong* (H); Thousand Islands of the St. Lawrence, Aug. 9, 1879, *Lester F. Ward* (Y); vicinity of Fisher's Landing, Thousand Islands, July 1902, *T. R. Robinson & W. R. Maxon*, no. 58a (H); Penn Yan, *H. P. Sartwell* (H). NEW JERSEY: Long Beach, *Read* (A). PENNSYLVANIA: found loose along the shore between Conshocken and Norristown, Aug. 9, 1868, *E. Diffenbaugh* (A); River opposite Harrisburg, Aug. 14, 1888, *T. C. Porter* (A no. 515,350); Susquehanna River, Safe Harbor, Lancaster County, July 13, 1861, *T. C. Porter* (A). DELAWARE: brackish water, Rehobeth, July 30, 1893, *A. Commons* (A). MARYLAND: off mouth of Mill Creek, in 25 inches of water, July 31, 1902, *G. H. Shull*, no. 140 (H); Sinepuxent Bay, Ocean City, July 25, 1875, *A. Commons* (A no. 543,578). NORTH CAROLINA: in 4 feet of water, mouth of North Channel, Currituck Sound, May 22, 1903, *G. H. Shull*, no. 457 (H). FLORIDA: *Chapman* (H). ONTARIO: Albany, James Bay, July 25, 1904, *W. Spreadborough* (C no. 62,659); Kingston, 1897, *Annie Boyd* (H); Kingston, Aug. 2, 1882, *J. Fowler* (A); Lake Scugog, Aug. 1, 1893, *J. Macoun* (C no. 16,473); Lakes and streams near Belleville, July 15, 1874, *J. Macoun* (C no. 3,017); Ashbridge's Bay, Toronto, June 19, 1896, *Wm. Scott* (C no. 16,464); Maitland River, Gooderich, Aug. 19, 1901, *J. Macoun* (C nos. 26,827

and 26,828); Sarnia Bay, Lambton County, July 7, 1896, *C. K. Dodge* (C no. 16,468); Pic River, Lake Superior, *Loring* (H). OHIO: Dayton, July 1883, *A. F. Foerste* (Y); INDIANA: Lake Maxinkickee, July 21, 1899, *A. W. Everman* (R); Wolf Lake, Sept. 3, 1900, *Agnes Chase*, no. 1,460 (A & H). MICHIGAN: shallow water, Algonac, July 29, 1901, *J. H. Shuette* (H); in water, Stony Island, Huron County, July 13, 1908, *C. K. Dodge*, no. 5 (H); Isle Royale, Sept. 2, 1910, *W. S. Cooper*, no. 311 (H); millpond, Alma, Aug. 30, 1893, *Chas. A. Davis* (H); Pine Lake near Michigan Agricultural College, July, 1895, *C. F. Wheeler* (H). WISCONSIN: Milwaukee, *I. A. Lapham* (H); shallow water on sandy bottom of lake, and muddy bottom of lakes, and running water, and sandy bottom of deep water lakes, Madison, *T. J. Hale* (A & Y); Duck Creek, Green Bay, June and Aug., 1878, *J. H. Shuette* (H); Green Bay, Sept., 1882, *J. H. Shuette* (H). ILLINOIS: Cedar Lake, Lake Villa, Aug. 8, 1906, *H. A. Gleason & F. D. Shobe*, no. 185 (H). MINNESOTA: Aug., 1889, *J. M. Holzinger* (R); Grand Lake, Stearn County, July, 1896, *Jennie E. Campbell* (R); Swan Lake, Nicollet County, July, 1892, *C. A. Ballard* (R). IOWA: Armstrong, July 29, 1897, *R. I. Cratty* (H.) NORTH DAKOTA: immersed in ponds, Leeds, July, 1899, *J. Lunell*, no. 36 (H); Wahalla, Aug. 18, 1902, *L. R. Waldron*, no. 1,643 (R); Lake Irvine, Maza, July 27, 1900, *J. Kildahl* (R). SOUTH DAKOTA: Lake Campbell, July 4, 1893, *T. A. Williams* (H & R); Sioux River, Brookings, July 4, 1894, *J. T. Thornber* (H); Bigstone, Aug. 24, 1892, *T. A. Williams* (H & R); Lake Hendricks, Aug. 8, 1894, *Griffiths & Schlosser*, no. 16 (R); Gettysburg, 1892, *Griffiths & Schlosser* (R). NEBRASKA: in East Cody's Lake, at the head of Dismal River, Aug. 9, 1893, *P. A. Rydberg*, no. 1,659 (H); in Dismal River, south of Thedford, Thomas County, June 27, 1893, *P. A. Rydberg*, no. 1,439 (H); Wood Lake, Aug. 13, 1898, *J. M. Bates* (H). TEXAS: Knickerbocker Ranch, Dove Creek, Tom Green County, May, 1880, *Frank Tweedy* (Y); *Wright* (H). SASKATCHEWAN: Cumberland House, 1825, *Drummond* (H); still and slow flowing water, Bullrush (Reed) Lake, July 25, 1879, *J. Macoun* (C no. 4,147); Bullrush Lake, July 26, 1880, *J. Macoun*, no. 170 (H); in a pool on the prairie, Frenchman's River, June 19, 1895, *J. Macoun* (C no. 16,466); in ponds and lakes, south of Battleford, Aug. 3, 1879, *J. Macoun* (C no. 3,018); in water, Moose Mountain Creek, July 8, 1884, *J. M. Macoun* (C no. 4,148); pools, Moose Jaw, June 20, 1894, *J. Macoun* (C no. 16,467); Ribstone Creek, Aug. 14, 1906, *J. Macoun & W. Herriot* (C no. 76,873); 23 miles east of Saskatoon, July 23, 1906, *J. Macoun & W. Herriot* (C no. 76,874). MONTANA: Great Falls, Sept. 8, 1885, and Sept. 6, 1885, *R. S. Williams*, nos. 284 and 286 (Y); Bitterroot Valley near Frenchtown, Aug. 4, 1880, *S. Watson*, no. 394 (H). WYOMING: Bath Lake, Sept. 8, 1896, *A. Nelson*, no. 2,781 (H & R); Laramie River, Aug. 10, 1895, *A. Nelson*, no. 1,668 (H); Laramie River, July 15, 1895, *E. Nelson*, nos. 3,387 and 3,387a (R); rolling plains

between Sheridan and Buffalo, altitude 3,500–5,000 feet, June 15–July 15, 1900, *Frank Tweedy*, no. 3,558 (R & Y); Soda Lakes, Sept. 24, 1898, *A. Nelson*, no. 5,352 (R); McGill's Ranch, Aug. 9, 1895, *A. Nelson*, no. 1,668 (R); Rockyford, July 6, 1896, *A. Nelson*, no. 2,219 (R). COLORADO: Saguache, Sept. *Wolf & Rothrock* (R); Lee's Lake, Sept. 24, 1896, *C. S. Crandall*, no. 2,527 (H); Hiram Prince Lake, July 10, 1908, *W. W. Robbins*, no. 5,744 (R). UTAH: 1875, *C. C. Parry*, no. 16.5 (H). NEVADA: Thousand Spring Valley, 6,000 feet altitude, Sept., 1868, *S. Watson*, no. 1,138 (H & Y); Truckee Pass, 4,000 feet altitude, July, 1867, *S. Watson*, no. 1,145 (H & Y); Humboldt Lake, 4,000 feet altitude, Aug., 1867, *S. Watson*, no. 1,139 (H & Y); Pyramid Lake, May, 1879, *Miss S. A. Plummer* (H). NEW MEXICO: Northern part, 1851–52, *C. Wright*, nos. 1,894 and 1,895 (H & Y). ARIZONA: Santa Cruz Creek near Tucson, May, 1881, *J. G. Lemmon*, no. 299 (H). CALIFORNIA: 1833, *Douglas* (H); *Dr. Coulter*, no. 719 (H); Soldier's Home, in reservoir, Los Angeles County, June 19, 1902, *LeRoy Abrams*, no. 2,575 (H); shallow borders of ponds, San Bernadino Mountains, Aug. 1882, *S. B. & W. F. Parish*, no. 1,429 (Y); Los Angeles, *Rev. J. C. Nevin*, no. 516 (H); Monterey, Oct. 1, 1894, *G. P. Snell* (R); ponds, San Francisco, 1868–9, *A. Kellogg & W. G. Harford*, no. 950 (Y); Berkeley, July 18, 1895, *J. W. Blankinship* (H); common in sloughs, Suisun, Solano County, June 6, 1903, *C. F. Baker*, no. 3,215 (H); Cuyamaca Lake, 4,600 feet altitude, San Diego County, June 26, 1903, *LeRoy Abrams*, no. 3,906 (A & H); Monterey, Oct. 1, 1904, *G. P. Snell* (A no. 522,547); Santa Barbara, 1879, *Mrs. Elwood Cooper* (H); banks of Russian River, north of Cloverdale, July 9, 1902, *A. A. Heller*, no. 5,825 (A & H & R). OREGON: near Prineville, 955 m. altitude, Aug. 28, 1894, *J. B. Leiberg*, no. 847 (H); 1871, *Elihu Hall*, no. 494 (H & Y); Cascade Mountains, 49° North Latitude, 1859, *Dr. Lyall* (H). WASHINGTON: shallow places in the Columbia River, Klickitat County, Sept. 15, and Oct., 1891, *Wm. Suksdorf*, no. 2,062 (H); Okanagan River, Oct. 10, 1880, *S. Watson*, no. 394 (A & H). BRITISH COLUMBIA: Kamloops, June 26, 1889, *J. Macoun* (H and C no. 4,151); in water, Alberni, Vancouver Island, Aug. 2, 1887, *J. Macoun* (C no. 4,145).

This species growing in so many parts of the world and varying so greatly, as do many species of the genus, has naturally received many names. The great majority of these are by common consent treated as synonyms of *P. pectinatus*, but there are some better marked states of the plant which are insistently maintained as distinct species. The English botanists, Fryer and Bennett and others, treat as *P. interruptus* Kit. (*P. flabellatus* Bab.) a plant with or without broad 3–5-nerved lower leaves and with three-keeled fruits. Morong included *P. interruptus* in his *Naiadaceae of North America* on the basis of sterile, broad-leaved plants, collected in Manistee, Michigan, by E. J.

Hill and by himself, and from one other station in the same state. His illustration was drawn from English specimens supplied him by Mr. Fryer. Following Morong, this species has been kept as a North American plant in Gray's *Manual*, in Britton and Brown's *Illustrated Flora*, and in Taylor's treatment in the *North American Flora*. The leaf characters of *P. interruptus* as stated by its defenders are admittedly inconstant.[1] The fruit character, which is the main claim of *P. interruptus* to specific rank, seems to be just as inconstant, at least in the American plants, as the foliage character proves to be in the European ones. In a single spike, such as that on the sheet collected by L. L. Dame at Nantucket, Massachusetts, now in the Herbarium of the New England Botanical Club, can be seen fruits which have prominent dorsal keels as does *P. interruptus*, and also fruits with evenly rounded backs as in *P. pectinatus* (*stricto sensu*).

A quotation from a letter written by Mr. Arthur Bennett to Prof. M. L. Fernald throws an interesting light on the status of *P. interruptus* Kit. (*P. flabellatus* Bab.) in North America. "Having occasion to look through all my *interruptus* specimens, I was surprised to find attached to the sheet of Manistee specimens sent me, a letter from Prof. Babington dated 9, 2, 1882 in which he says 'Certainly I do not think that the Revd. Morong's plant is *Pot. flabellatus*. The habit of the flowering part is totally different from any specimens of my plant that I have seen.'" Bennett continues, "I cannot now understand why he [Morong] doubted Babington's decided opinion that it was not his *flabellatus*." Whether or not the European specimens of *P. pectinatus* will allow a division into *P. pectinatus* in its limited sense and *P. interruptus* (which is very doubtful), it seems to be clear that Morong was not justified in including *P. interruptus* as an American species. Likewise the more recently collected specimens and published notes seen by the author have not convinced him that any American plants can properly be treated as *P. interruptus* Bab.

P. columbianus Suksdorf [2] is worthy of mention in this connection, since it is not included in the *Pflanzenreich* or the *Index Kewensis*. Neither the duplicate-type material nor the description show any distinctive characters to separate it from *P. pectinatus*.

W. R. Dudley discusses [3] two plants from Cayuga Lake, New York,

[1] Fryer, Journ. Bot. xxvii. 59, (1889).
[2] Suksdorf, Deutsche Bot. Monatschr. xix. 92 (1901).
[3] Dudley, Cayuga Flora 107 (1886).

which he treats in both cases as *P. pectinatus* L. var.—? Number 1007 is a slender "sometimes proliferous" form "whose peduncle is usually over $\frac{1}{4}$ m. long." Number 1008 is a gigantic form, with plume-like bushy tops, up to $5\frac{1}{2}$ m. in length, frequently proliferous, not found in flower or fruit. These plants have been known for many years, the latter since 1874, and have received intensive study by local observers for a number of years.

Through the kindness of Miss Emmeline Moore the author has been able to examine specimens corresponding to each of these numbers. Number 1007 is a very much elongated, deep-water state of *P. pectinatus*, but not distinct enough to require any special designation. Number 1008 proves to be similarly elongated, sterile *P. moniliformis* St. John.

3. P. LATIFOLIUS (Robbins) Morong, Mem. Torr. Bot. Club, iii. no. 2, 52 (1893). *P. pectinatus* L., var. (?) *latifolius* Robbins, Bot. King's Exp. 338 (1871).— Stem 1–2 mm. thick, whitish, freely branching above: leaves linear, obtuse or shortly apiculate, 2–4 mm. wide, 3–5 nerved with strong cross-veins making a rectangular pattern; the upper short, 1.5–2.5 cm. long; sheaths swollen, 2–4 times thicker than the stem; ligule short, obtuse, hyaline: peduncles short, 2–10 cm. long: spikes interrupted, 1–3 cm. long: fruit obovate, 3 mm. long, 2 mm. wide; style borne near the ventral margin, incurved.— Deep waters, still or flowing, Oregon, south to California and Arizona. NEVADA: Humbolt Lake, 4,000 feet altitude, Aug., 1867, *W. W. Bailey*, no. 1,142 (H); Hot Springs, Desert, Aug. 1874, *J. G. Lemmon*, no. 1,264 (H). ARIZONA: Santa Cruz Creek, Tucson, 1881, *J. G. Lemmon*, no. 579 (H). CALIFORNIA: King's River, 1876, *J. G. Lemmon*, no. 1,521 (H); in waters warmed by hot spring above 14 mile station, Bridgeport and Sonora Road, Mono County, Aug. 23, 1898, *J. W. Congdon*, no. 9,915 (H). OREGON: Goose Lake, July 23, 1897, *B. W. Evermann* (H).

4. P. **moniliformis**, n. sp., rhizomate 2–3 mm. crasso; caule superne valde ramoso, ramis 2–4 ad nodum, vaginis principalibus inflatis, quam caules 2–5-plo crassioribus, 2.5–5 cm. longis, 2–5 mm. latis, laminis brevibus obtusis habenis similibus latis, 1–4.5 cm. longis, 1–2 mm. latis, venis transversis nervisque reticulum crassum formantibus, nervis vaginarum prominentibus ad apicem incurvatis ligulam integram brevissimam defugantibus; foliis superioribus filiformibus obtusis vel retusis, 5–11 cm. longis, 0.2–1 mm. latis cum ligulis longioribus; pedunculis brevibus, 3–8 cm. longis, spicis interruptis, 1–6 cm. longis, verticillis multis (5–12) aequidistantibus vel inferioribus remotis, fructubus oblique obovatis non manifeste carinatis, 3 mm. longis, 2 mm. latis, stigmatibus sessilibus ad margines ventrales proximis.

Rootstock coarse, 2–3 mm. thick: stem freely branching above; 2–4 branches at a node: principal sheaths swollen, 2–5 times thicker than the stem, 2.5–5 cm. long, 2–5 mm. broad, with prominent veins bending into the blade but not appearing in the entire very short (1 mm.) ligule; blade short, blunt, ribbon-like, 1–4.5 cm. long, 1–2 mm. broad, the veins and cross veins forming a coarse rectangular pattern; upper leaves filiform, blunt or more commonly retuse, 5–11 cm. long, 0.2–1 mm. broad; upper sheaths less swollen, bearing longer ligules: peduncles short, 3–8 mm. long: spikes 1–6 cm. long, interrupted, with numerous (5–12) whorls of flowers, which are equally spaced or the lower more remote: fruit obliquely obovate, not prominently keeled, 3 mm. long, 2 mm. wide; the sessile stigma borne near the ventral margin.— Deep waters from Labrador west to Saskatchewan and Alberta and south to New York, Wisconsin, and North Dakota.

LABRADOR: shallow sandy-bottomed pools, Blanc Sablon River, Aug. 2, 1910, *M. L. Fernald & K. M. Wiegand*, no. 2,463 (H). QUEBEC: above tide mark in Blanc Sablon River, Brest, Saguenay County, July 31, 1915, *Harold St. John* (C). ONTARIO: Moose Factory, James Bay, July 15, 1904, *W. Spreadborough*, (C no. 62,661); shallow water, Misinaibi River, Aug. 1880, *R. Bell*, (C no. 3,013) NEW YORK: in 8 feet of water, Lake Cayuga, July 16, 1916, *Emmeline Moore*. MANITOBA: Palliser's Brit. N. Am. Expl. Expedition, Lac Winnipeg, 26 Juin 1859, *E. Bourgeau* (H & Y). SASKATCHEWAN: between Cumberland House and Hudson Bay, Aug., *Drummond* (H, TYPE); and on the same sheet, Carleton House (H); Palliser's Brit. N. Am. Expl. Expedition, 1858, *E. Bourgeau* (H & Y); Long Lake, July 6, 1879, *Macoun*, (C no. 4,176 & Y); in Cypress Lake, Cypress Hills, June 29, 1895, *Macoun*, (C no. 16,470); in water, Buffalo Lake, Aug. 3, 1888, *J. M. Macoun*, (C no. 4,175). WISCONSIN: University Bay, Lake Mendota, Aug. 19, 1912, *R. H. Denniston* (H). NORTH DAKOTA: Turtle Mts., Aug. 20, 1891, *Wright*, no. 727 (R). ALBERTA: Vermilion Lake, Banff, Rocky Mts., Aug. 13, 1891, *Macoun*, (C no. 4,374 in part); Vermilion Lakes, 4,500 feet altitude, Banff, July 23, 1906, *S. Brown*, no. 695 (A); in a lake, Milk River Ridge, July 20, 1895, *Macoun*, (C no. 16,469).

In 1854 *P. vaginatus* Turcz.[1] was described from a subsaline lake near Selenginsk, south of Lake Baikal, Siberia. In the original diagnosis the following characters are mentioned: sheaths loose, flowers in interrupted whorls, fruit obliquely obovate, finely striate, and leaves linear-setaceous, acute. Kihlman,[2] in recording *P. vaginatus* Turcz. from Europe for the first time, gives a careful description of the type material and a critical discussion of the species. He

[1] Turcz., Bull. Soc. Natur. Moscou, xi. 102 (1838) (nomen solum), xxvii. 65 (1854); Flora Baicalensi-Dahurica ii. 162 (1856).

[2] Osw. Kihlman, Meddel. af Societas pro Fauna et Flora Fennica, xiv. 111–115 (1887).

mentions the tall freely-branching habit, the blunt or retuse leaves, the ample clasping finely striate olive-green sheaths, the very short (1 mm.) entire ligule, the long spike of 5–11 (usually 7–8) whorls, which are equally distant or the lower farther spaced. All of these points would fit the American *P. moniliformis* described above, and, in fact, in Kihlman's citation of stations, with the six in Finland and Sweden, is one in North America: Saskatchawan, Bourgeau, Palliser's Expedition 1858, which he had seen in the Herbarium at St. Petersburg. The two sheets of this collection seen by the writer are tall coarse, freely branching plants with six and seven whorls, but they are very immature and show no sign of fruit. The American material with fruit shows it to be but 3 mm. long and with the sessile stigma borne near the ventral margin. On the other hand *P. vaginatus* Turcz. has the "fruit 3.2–3.5 mm. long and the stigma flattened, almost median on the fruit." [1] Bennett [2] says of it "beak very short, central," and his plate 58 drawn from Swedish specimens shows clearly this condition. It is because of this fundamental difference in the form of the fruit, the asymmetric position of the stigma, that I have described the American *P. moniliformis* as a distinct species. In recording *P. vaginatus* from Great Britain Bennett [3] cites two American stations, Assiniboia, Macoun! Buffalo Lake; and Labrador, Waitz! in herb. Boissier. The Buffalo Lake material, as cited above is *P. moniliformis* and the Labrador material may well be the same.

5. P. FILIFORMIS Pers., Syn. pl. i. 152 (1805). *P. marinus*, var. (?) *occidentalis* Robbins, King's Rep. 339 (1871). *P. filiformis*, var. *occidentalis* (Robbins) Morong, Mem. Torr. Bot. Cl. iii. No. 2, 51 (1893); Bennett, Ann. Conserv. Jard. Genève ix, 102 (1905). *P. interior* Rydb., Fl. Colorado, 13 (1906); *P. marinus* L. acc. to some authors, not L. herb. Rootstock creeping: stem usually short and repeatedly branched near the base giving the plant a very bushy habit, but in deep water the branching reduced and the stem elongated up to 30 cm.: sheaths short, tightly clasping the stem, not becoming divergent, about as long as the scarious early deciduous ligule; blades filiform, blunt, 5–12 cm. long, 0.25–0.5 mm. wide: peduncle exceeded by or overtopping the leaves: mature inflorescence elongate, interrupted, 1.5–5 cm. long; verticels mostly remote, the upper usually 3–12 mm. apart, the lower usually 0.7–2.5 cm. apart: fruit obovate, 2 mm. long, 1.5 mm. wide; the stigma broad and sessile.—Shallow pools, chiefly in calcareous areas in the boreal parts of North America; also Eurasia, Africa and Australia.

[1] Kihlman, l. c.

[2] Bennett in Fryer, Potamogetons of the British Isles 88, Plate 58 (1915).

[3] Bennett, Bull. Herb. Boissier iii. 257 (1895), and Journ. Bot. XLV. 172 (1907).

KEEWATIN: Cape Henrietta Maria, Hudson Bay, Aug. 14, 1904, *W. Spreadborough*, (C no. 62,660); Churchill, Hudson Bay, Lat. 58° 50′, Aug. 3, 1910, *J. M. Macoun*, (C no. 79,199 & H). QUEBEC: St. John (or Douglastown) River, Gaspé County, Aug. 23, 1904, *J. F. Collins, M. L. Fernald, & A. S. Pease* (C & H). VERMONT: shallow bay south of "Carry," North Hero, Aug. 2, 1899, *Ezra Brainerd* (H). NEVADA: Ruby Lake, alt. 6,000 feet, Aug., 1868, *Sereno Watson*, no. 1,143 (H & Y). ALASKA: shallow pools, St. Paul Island, Bering Sea, July 15, 1897, *J. M. Macoun*, (C no. 28,158).

Several recent European workers have subdivided this species into varieties or forms.[1] A tall coarse plant with leaves over 1 mm. in breadth is treated as var. *alpinus* (Blytt) Asch. & Graeb. This variety seems to be quite distinct. The species has been further divided on the basis of the overtopping of the spikes by the leaves or the reverse and the elongation or dwarfing of the stem, making a series of four forms or varieties. The variation in these parts seems to be due mainly to the fluctuations in the water level and to be negligible from our standpoint. All of the European specimens of *P. filiformis* Pers. and its varieties are characterized by having an elongate spike formed of mostly remote whorls.

For many years this plant was treated as *P. marinus* L. This Linnean species is very difficult to interpret with any surety on the basis of its description in the *Species Plantarum* or the sources cited there. A. Bennett discussed the basis of *P. marinus* in 1890[2] and again in 1895[3] concluding that "Most European authors use the name *P. marinus* Linn. In the Linnean Herbarium the specimens named *marinus* are only *pectinatus*"; and, following Bennett, the name *P. filiformis* has been almost universally adopted for the plant under discussion. A most disconcerting discovery is that Bennett himself in his most recent work has reverted to the name *P. marinus*.[4] In reply to my request for an explanation of this change Mr. Bennett dwells on the pre-Linnaean sources cited in the *Species Plantarum*, especially Boccone, *Icones et Descrip. Pl. Siciliae*, 42, and t. 20, f. 5 (1674) He concludes that, "This drawing might well have been made for a species of *P. fasciculatus* of Wolfgang, which is only a small *filiformis!*" Mr. Bennett is quite correct in saying that Boccone's *Potamogeiton pusillum fluitans* might be some phase of the plant we

[1] Hagström in Neuman, Sveriges Flora, 794 (1901); Ascherson & Graebner, l. c.; Fischer, l. c.

[2] Bennett, Journ. Bot. xxviii. 301 (1890).

[3] Bennett, Bull. Herb. Boissier iii. 257 (1895).

[4] Bennett in Fryer, l. c. 89 (1915).

recognize as *P. filiformis*, but for anything that appears in Boccone's figure or description it might equally well be some form of the polymorphic *P. pectinatus*. In just such cases as this we are authorized by the International Rules for Botanical Nomenclature to cast aside the name "when it becomes a permanent source of confusion."[1] *P. setaceum* Schum.[2] is plainly the plant in question. In fact, Mr. Bennett writes "I have seen a specimen named by him [Schumacher] in Dr. Buchenau's herbarium." The name *P. setaceum* Schum. cannot stand because it is antedated by a Linnean plant of the same name, one which is maintained. The next name given to this plant was *P. filiformis* Pers., based on Schumacher's plant, and this name seems perfectly valid. Bennett when using the name *P. filiformis* credits it to Nolte, but Nolte did not make this combination. He credits it to Persoon, "84. *Potamogeton filiformis* Persoon," and gives the Schumacher reference.

P. filiformis Pers., var. *occidentalis* (Robbins) Morong, Mem. Torr. Bot. Club iii. no. 2, 51 (1893) (*P. interior* Rydb.) from Ruby Lake, Nevada, is a coarse sparsely branched plant, 5–6 dm. high, with a few rather coarse leaves (0.5–0.7 mm. broad). Among the hundreds of sheets of this group examined I have seen none to match the two sheets at hand of the original collection of var. *occidentalis*, consequently it seems better to treat this plant (subsequently renamed *P. interior* Rydb.) as a somewhat exceptional deep-water state of the species.

P. FILIFORMIS Pers., var. **borealis** (Raf.) n. comb. *P. borealis* Raf., Med. Repos. ii. 354 (1808). Resembling *P. filiformis* but differing in the strongly marked tendency to have the spike short, with the whorls approximate: leaves finely setaceous, 0.25–0.5 mm. broad; mature spike 0.5–2.5 cm. long, the upper verticels mostly approximate, the lower approximate or at most 7 mm. apart.— Chiefly in calcareous waters, Newfoundland to northern Maine, New York and Pennsylvania, west to Alaska and south to Colorado; also in India, Tibet and China.

NEWFOUNDLAND: border of Castle Pond, Tilt Cove, northern shores of Notre Dame Bay, Aug. 21, 1911, *M. L. Fernald, K. M. Wiegand & H. T. Darlington*, no. 4,493 (H); shallow pools, wet runs and boggy spots in limestone barrens, near sea-level, Ingornachoix Bay, Aug. 4, 1910, *M. L. Fernald, K. M. Wiegand & J. Kittredge Jr.*, no. 2,460 (H); pools on serpentine tableland, 550 m. altitude, northeast-

[1] Internat. Rules Bot. Nomen., Vienna, Art. 51, 4 (1905).
[2] Schumacher, Enum. Pl. Saellandiae i. 51 (1801).

ern region of the Blomidon ("Blow-me-down") Mountains, region of Bay of Islands, Aug. 21, 1910, *M. L. Fernald & K. M. Wiegand*, no. 2,459 (H); shallow pools near Harry's River, Silurian region between Bay St. George and Bay of Islands, Aug. 18, 1910, *M. L. Fernald & K. M. Wiegand*, no. 2,458 (H); shallow stream, wet runs and boggy spots in limestone barrens, upper slopes and tablelands, 200–300 m. altitude, Table Mountain, region of Port au Port Bay, Aug. 16, 1910, *M. L. Fernald, K. M. Wiegand & J. Kittredge Jr.*, no. 2,457 (H). QUEBEC: Shallow water, Lake Mistassini, Aug. 10, 1885, *J. M. Macoun* (C no. 3,012); shallow pond, Longue Pointe, Brest, Saguenay County, July 31, 1915, *H. St. John* (C); in 5 feet of water, small pond, Ile à Chasse, Mingan Islands, Sept. 10, 1915, *H. St. John* (C); brackish ponds, Salt Lake, Anticosti, Aug. 10, 1883, *J. Macoun* (C no. 3,015); in water, Madeline River, Gaspé County, Aug. 5, 1882, *J. Macoun* (C no. 3,014); shallow pool, margin of River Ste. Anne des Monts, Aug. 17, 1906, *M. L. Fernald & J. F. Collins*, no. 160 (C & H); marl, Trout Pond, mouth of the Grand River, Aug. 11–15, 1904, *J. F. Collins, M. L. Fernald & A. S. Pease* (C & H); dead waters between the Forks and Brûlé Brook, Little Cascapedia River, Bonaventure County, July 29 & 30, 1904, *J. F. Collins, M. L. Fernald & A. S. Pease* (H). MAGDALEN ISLANDS: edge of pond in sand dunes, Brion Island, Aug. 6, 1914, *H. St. John* (H). PRINCE EDWARD ISLAND: shallow pools among the sand hills, Brackley Point, Aug. 3, 1914, *M. L. Fernald & H. St. John*, no. 10,895 (H). MAINE: about cold springs in marl, margin of Nadeau Lake, Fort Fairfield, Aug. 18, 1901, *M. L. Fernald* (H & N & R). NEW YORK: on sandy bottom, 1.5 feet deep, Seneca Lake, Geneva, Aug. 14, 1884, *T. Morong* (H); western part, *A. Gray* (H); in the rapids above Niagara Falls, Aug. 20, 1875, *T. Morong* (H). PENNSYLVANIA: in Cedar Creek at the Duck Farm Hotel, at the foot of Walnut Street, Allentown, July 27, 1912, *H. W. Pretz*, no. 4,851 (A); Allentown, com. Oct. 7, 1878, *Eugene A. Rau* (A); Cedar Creek, Lehigh County, 1878, *A. F. K. Krout*, Series A no. 2,724 (A); swift stream, submerged, Cedar Creek, near Griesemer's Hotel, July 16, 1912, *Daniel W. Hamm*, no. 1,139 (A); Presque Isle, Erie, Sept. 11, 1869, *Garber* (A). KEEWATIN: in pools or tundra, Ranken Inlet, Hudson Bay, latitude 62° 45′, Aug. 30, 1910, *J. M. Macoun* (C no. 79,200). ONTARIO: shallow ponds, "The Twins," James Bay, July 7, 1887, *J. M. Macoun* (C no. 4,148); above Niagara Falls, July 12, 1901, *J. Macoun* (C no. 26,838); Lake Scugog, *W. Scott*, Aug. 12, 1891, (C no. 16,465). MICHIGAN: Crystal Lake, Frankfort, Aug. 13, 1880, *E. J. Hill* (H); Charlevoix, Aug. 26, 1894, *C. F. Wheeler* (H); Rapids of St. Mary's River, Sault Ste. Marie, Aug. 25, 1882, *T. Morong* (H & Y). SASKATCHEWAN: plains, Aug. 16, 1872, *J. Macoun* (C no. 62,583); west of Yorkton, July 7, 1906, *J. Macoun & W. Herriot* (C no. 76,877); in shallow water, Crane Lake, June 22, 1894, *J. Macoun* (C no. 4,375). ATHABASCA: Peace River Landing, June 30, 1903, *J. M. Macoun* (C no.

61,283). ALBERTA: west of Banff, July 6, 1891, *J. Macoun* (C no. 4,384); near Banff, July 15, 1891, *J. Macoun* (C no. 4,376); Bow River Valley, 4,500 feet altitude, July 28, 1906, *Stewardson Brown*, no. 680 (A). MONTANA: Corvallis, Bitterroot Valley, July 29, 1880 *S. Watson*, no. 393 (H); near Frenchtown, Bitterroot Valley, Aug. 4, 1880, *S. Watson* (H). WYOMING: Lower Basin, Yellowstone Park, 7,300 feet altitude, July 15, 1906, *W. S. Cooper*, no. 74y (R); brackish ponds, Yellowstone Park, Aug. 1884, *Frank Tweedy* (Y); Upper Geyser Basin, Sept. 1, 1878, *C. Richardson* (H); Big Horn Mountains, July–Aug., 1897, *T. A. Williams* (R). COLORADO: Twin Lakes, Sept., *Wolf & Rothrock* (H); Gunnison, 7,680 feet altitude, Aug. 16, 1901, *C. F. Baker*, no. 828 (H & R); Buena Vista, *J. H. Ferriss* (H). UTAH: Bear River, 8,000 feet altitude, Aug., 1869, *S. Watson*, no. 1,144 (H & Y). ROCKY MOUNTAINS: *Drummond*, no. 134 (H). BRITISH COLUMBIA: fresh water lakes, near Kicking Horse Lake, 5,500 feet altitude, Aug. 15, 1890, *J. Macoun* (C no. 3,010). YUKON: mud in Klondike River, near Dawson, July 15, 1902, *J. Macoun* (C no. 79,029); in water, Lewis River, Dawson, latitude 62°, Sept. 6, 1887 (C no. 4,146). ALASKA: water, Atkah Island, Aleutian Islands, Aug. 26, 1891, *J. M. Macoun* (C no. 28,159). INDIA: Garhwál, elevation 15,000 feet, *R. Strachey & J. E. Winterbottom* (H). TIBET: left shore of the Indus near Leh, Province of Ladák, July 5–10, 1856, *Schlagintweit*, no. 923 (H). CHINA: 1873, *Korolkoff & Krause* (H).

Rafinesque's name *P. borealis* is based on the description in Michaux's *Flora Boreali-Americana*, i. 102 (1803) of *P. marinum?* L., for plants found in subsaline rivers flowing into the St. Lawrence. Michaux's use of the phrase "spica —, quasi verticillatim interrupta" indicates that he was describing the plant with a short spike of nearly approximate whorls. Thus we can use Rafinesque's name to designate this commonest American variety of *P. filiformis*. It is worthy of note that in the paper referred to, Rafinesque indicates as new species, four Potamogetons "that have been considered congenial to some European species; but which upon investigation, have appeared to me different." Three of these, *P. epihydrus*, *diversifolius*, and *foliosus* have already been taken up and now we can recognize as of varietal rank the fourth, his *P. borealis*.

The var. *borealis*, like typical *P. filiformis*, is found with the spike exceeding or exceeded by the leaves and the stem short, bushily branched, or in deep water less branched and the stem elongate.

P. FILIFORMIS Pers., var. MACOUNII Morong, Mem. Torr. Bot. Club, iii. no. 2, 50 (1893). *P. marinus* L., var. *Macounii* Morong in Macoun, Cat. Can. Pl. iv. 88 (1888).— Resembling var. *borealis* in its short spike of mostly approximate whorls, but differing in having broad

coarse leaves 0.75–2 mm. broad and sometimes apiculate at tip.—Still or flowing waters, Magdalen Islands, Quebec and Prince Edward Island and from northern Ontario to Saskatchewan, South Dakota and California.

Magdalen Islands: brook in a springy marsh, Grindstone, Grindstone Island, July 17, 1912, *M. L. Fernald, E. B. Bartram, B. Long & H. St. John*, no. 6,792 (H); shallow pools and slow brooks in a larch swamp, Grindstone, Grindstone Island, Aug. 13 & 14, 1912, *M. L. Fernald, B. Long & H. St. John*, nos. 6,785 and 6,786 (H). Prince Edward Island: water, North Pond, near East Point, Aug. 15, 1888, *J. Macoun* (C no. 4,373a); North Pond, Aug. 15, 1888, *J. Macoun* (C no. 4,373). Ontario: The Beacon, Mouth of the Moose River, James Bay, July 19, 1904, *W. Spreadborough* (C no. 62,664). Manitoba: four miles east of Forest, June 19, 1906, *J. Macoun & W. Herriot* (C no. 76,875); six miles east of Forest, June 19, 1906, *J. Macoun & W. Herriot* (C no. 76,876). South Dakota: Rapid Creek below Pactola, 4,400 feet altitude, Black Hills National Forest, July 14, 1910, *J. Murdoch Jr.*, no. 4,250 (H); Black Hills, 1887, *Dr. W. H. Forwood* (H). Saskatchewan: in salt marshes, Old Wives Lake, July 23, 1880, *J. Macoun* (C no. 3,008); west of Yorkton, July 7, 1906, *J. Macoun & W. Herriot* (C no. 76,878); Moose Mountain Creek, July 1, 1883, *J. M. Macoun* (C no. 3,016). Alberta: still or slow flowing water, south of the Hand Hills, Aug. 22, 1879, *J. Macoun* (C no. 3,009); Vermilion Lakes, Banff, Aug. 13, 1891, *J. Macoun* (C no. 4,374a); Vermilion Lakes, Banff, July 15, 1891, *J. Macoun* (C no. 4,376). Montana: ditches, Belgrade, Bozeman, Aug. 19, 1905, *J. W. Blankinship*, no. 572 (A). Idaho: in a slough, Henry's Lake, Fremont County, Sept. 1, 1899, *A. Nelson & E. Nelson*, no. 6,808 (H). Wyoming: flowing water, Norwood Creek, Big Horn County, Aug. 9, 1901, *L. N. Gooding*, no. 508 (H); Granger Ham's Fork, July 30, 1897, *A. Nelson* 4,142 (H & R); Evanston, July 10, 1897, *T. A. Williams* (H & R); shallow ponds, Jackamore Creek, 50 miles north of Point of Rocks, *E. D. Merrill & E. N. Wilcox*, no. 608 (H & R); in a woodland pool, Snake River, Aug. 12, 1899, *A. Nelson & E. Nelson*, no. 6,483 (R); in a slough, Henry's Lake, Fremont County, Sept. 1, 1899, *A. Nelson & E. Nelson*, no. 6,808 (R); in streams, Dayton, 4,000 feet altitude, Sheridan County, Sept., 1899, *Frank Tweedy*, no. 2,259 (Y); Fort Bridger, Aug. 6, 1873, *T. C. Porter* (A); Sour Creek, 8,200 feet altitude, Yellowstone Park, Sept., 1885, *Frank Tweedy* (Y); Shoshone Creek, Geyser Basin, Yellowstone Park, Aug. 22, 1878, *C. Richardson* (H); in a woodland pool Snake River, Yellowstone Park, Aug. 12, 1899, *A. Nelson & E. Nelson*, no. 6,483 (H). Colorado: in Tomichi River, Parlin, 8,000 feet, Gunnison County, Aug. 20, 1901, *B. H. Smith* (A). Utah: Fish Lake, 9,000 feet altitude, Aug. 9, 1894, *M. E. Jones*, no. 5,782 (R). Nevada: Ruby Lake, 6,000 feet altitude, 1868, *S. Watson*, no. 1,140 (Y). California: Leavitt's Meadows, Bridgeport and Sonora Road, Mono County, Aug. 22, 1898, *J. W. Congdon*, no. 99.14 (H).

Morong in his monograph limits this variety to the plants of the shallow pools which have "a compact, bushy habit, leaves 1–3 inches long." This passes without perceptible demarcation to the equally coarse plant with longer leaves and an elongate stem. It seems better and more consistent to include these under the var. *Macounii*. A plant cited [1] as *P. juncifolius* Kern. from North Pond, Prince Edward Island, seems to belong here.

Another American specimen named *P. juncifolius* Kern. from Labrador, in the Ungava River, Fort Chimo, Aug. 23, 1896, *Spreadborough*, (C no. 16,471) may be correctly identified, but it is so young that it is difficult to name with any certainty.

HARVARD UNIVERSITY.

LAPPULA DEFLEXA IN VERMONT.

J. R. CHURCHILL.

As a result of my discovery in July, 1914, of a considerable colony of the "Nodding Stickseed," *Lappula deflexa* (Wahlenb.) Garcke, in Derby, Orleans County, Northern Vermont, I have been interested to investigate the history and the range of this attractive though somewhat weedy stranger. The plants were growing along one side of the main road leading south from Derby Line, in open country, about a mile from the village. The highway appeared to have been recently, extensively repaired or reconstructed, thus confirming the impression that the plants had been introduced.

Like all the Stickseeds *L. deflexa* is admirably adapted by its prickly-barbed nutlets to easy and wide distribution by railroads and other carriers. And yet my brief study of this species and its history indicates that, despite these devices for migration, the plant has failed hitherto to extend materially its long recorded range. *Lappula deflexa* (*Echinospermum deflexum*, Lehm.) is found in Siberia and continental Europe and has long been known in the extreme northwestern United States and the adjacent Canadian provinces. And recent collections by Prof. Fernald and others show that the species is indigenous in

[1] Bennett in Journ. Bot. xlvi 162 (1908).

Percé and extreme eastern Quebec. But between these Eastern and Western ranges lies a vast territory where our plant is scarcely known; being represented in the Gray Herbarium by three or four collections only, and these from stations which are sporadic and transitory.

In 1882, Dr. Gray, revising *Echinospermum deflexum*,[1] distinguished the "variety *Americanum* (which makes some approach to *E. Virginicum*) the somewhat more granulate dorsal disk not rarely bearing two or three small glochidiate prickles on an obscure midnerve." And in the last edition of the Manual, this variety is cited with brief characterization, and given a range "Iowa to Manitoba, westw. and northw." only. Now among the few specimens of transitory occurrence to which allusion is made above, collected between these far distant stations in eastern Canada and our extreme northwest territory, is one in the Gray Herbarium, labeled "Bluffs of the Mississippi, Clinton County, Iowa, 6–20–1878, leg. Geo. D. Butler."

Upon this collection alone cited by Dr. Gray, rests the record of the occurrence of *L. deflexa*, var. *americana* in Iowa. Careful examination however, shows clearly that this Iowa plant is typical *L. deflexa;* and with this corrected determination apparently disappears all record of the occurrence of the variety *americana* within the limits of Gray's Manual.

Lappula deflexa is not given in the first edition (1898) of the Illustrated Flora of Britton and Brown, and our plant appears there as *Lappula americana* (A. Gray) Rydberg. In the last edition (1913) the treatment is reversed, the species appearing as *L. deflexa* (Wahl.) Garcke, and variety *Americana* is not recognized as valid. And the ranges given are substantially in accord with those of the Gray Manual.

It is certain that my Vermont plants have the few barbed prickles along the middle of the nutlets which are characteristic of the varietal form, and it seems to follow that this little colony has traveled hither from its home in the far West, rather than the much nearer "Eastern Quebec," the home of the typical plant with the smoother nutlets.

It may be noted that the plant here discussed forms an addition to the recorded flora of Vermont, as it does not appear in the recently published new edition of the state flora. Vt. Agric. Sta., Bull. 187 (1915).

It will be interesting to observe whether also it persists and increases

[1] Proc. Am. Academy, XVII, p. 224, note.

in its new station. Possibly, too, this note may bring forth information from other herbaria concerning this vagrant; specimens of which have been placed in the Herbarium of the New England Botanical Club.

In this pleasant task I have had the advice and assistance of Mr. J. Francis Macbride, who, in connection with his own technical and critical studies in the revision of the Boraginaceae at the Gray Herbarium, has carefully determined all the collections which I have mentioned.

DORCHESTER, MASSACHUSETTS.

PRUNUS VIRGINIANA THE CORRECT NAME OF THE CHOKE CHERRY.

M. L. FERNALD.

THE Choke Cherry of the northern United States and Canada, characterized by having the comparatively short leaves with sharp fine serrations and the crimson fruit in comparatively short racemes, has in recent years been generally known as *Prunus virginiana* L. or, by those who treat it as belonging to a separate genus, *Padus virginiana* (L.) Mill.; while the more southern Black or Rum Cherry, having longer leaves with short incurved blunter teeth and more elongated racemes of purplish-black cherries on purplish pedicels, has been generally known as *Prunus serotina* Ehrh. Very recently however the Choke Cherry has appeared in American literature [1] under the name *Padus nana* (Du Roi) Roemer, while the Black Cherry is called *Padus virginiana* (L.) Mill. This change from established usage in the interpretation of the specific name *virginiana* based upon *Prunus virginiana* arises, apparently, through a somewhat natural misinterpretation as to exactly what Linnaeus had. The Linnean treatment of *Prunus virginiana* was as follows:

"PRUNUS floribus racemosis, foliis deciduis basi antice glandulosis. *Virginiana.*

Cerasus sylvestris, fructu nigricante in racemis longis pendulis phytolaccae instar congestis. *Gron. virg.* 54. *Roy. lugdb.* 537.

[1] Britton in Britton & Brown, Ill. Fl. ii. 329 (1913).

Cerasi similis arbuscula mariana, padi folio, flore albo parvo racemofo. *Pluk. mant.* 43. *t.* 339. *Catesb. car.* i. *p.* 28. *t.* 28.
Habitat in Virginia." [1]

From this description it appears that Linnaeus gave an original diagnosis and originated the name *virginiana*, and that to the species described and so named he ascribed as synonyms the earlier "*Cerasus sylvestris*" of Gronovius and of Royen and the '*Cerasus similis arbuscula*" etc. of Plukenet and of Catesby. The description by Gronovius and the identical description by Royen leave no question that they were referring to the Black Cherry. In fact, Gronovius, in his second edition, cites *Clayton* No. 627, which, as shown by the type material examined by Dr. Gray in 1869, was the Black Cherry, indicated by Dr. Gray in his notes as "*Prunus serotina!*" Similarly, Catesby's figure and description belong clearly to *P. serotina* as recently understood; but the Plukenet figure, as recorded by Dr. Gray in a manuscript upon the original sources, is "*Itea virginica!*" In the first half of the 19th century the name *Prunus serotina* was used for the Choke Cherry and *P. virginiana* for the Black Cherry, just the reverse of recent usages, so that it is not surprising that there has been much confusion as to which name belonged to either species. The original Linnean element of *Prunus virginiana*, however, the plant which furnished the Linnean diagnosis and which Linnaeus marked "*Virginiana*" in his herbarium, differs from the material which he cites in synonymy, and is the true Choke Cherry. This is indicated by Dr. Gray's manuscript notes made upon examination of the Linnean herbarium at different times. Three times he specially notes this type, once, in 1839, when the Choke Cherry was generally called *Prunus serotina*, saying "*Prunus Virginana!* Linnaeus' specimens are *Prunus serotina* [in the old sense] (Choke-Cherry!) with the sharply mucronate serrations, erect racemes, etc." The other two records, made in 1869 and in 1881, merely reaffirm the conclusions of the earlier examination by recording in manuscript: "*Prunus Virginiana* = Choke cherry." From this evidence it would appear that the real type of *Prunus virginiana* is the Choke Cherry and that only confusion can arise by changing the long established and correct application of the name.

Gray Herbarium.

[1] Linnaeus, Sp. Pl. i. 473 (1753).

A BELATED CORRECTION.

BAYARD LONG.

RECENT correspondence with Professor Fernald has brought to light a little matter which has proved to be of sufficient interest, possibly, to be worth putting upon record. Toward the close of a letter, he wrote: "In the last number of Bartonia I noted a statement which may or may not be worth while to call to the author's attention. In the note by O. H. Brown on *Juncus brachycarpus* it is stated that the species occurs at Fort Fairfield, Maine. This must have arisen through some clerical confusion for the plant at Fort Fairfield, as throughout north and central Maine, is *Juncus brachycephalus*. *J. brachycarpus* is known in New England only at the Ocean Beach and Scituate stations, the latter now apparently destroyed."

When I had found *Juncus brachycarpus* among the 1913 collection of plants from Cape May, New Jersey, which Mr. O. H. Brown had sent for identification and deposit in the Herbarium of the Philadelphia Botanical Club, I had written him of his interesting addition to the New Jersey flora, and on further correspondence over the note for Bartonia, I had looked up some of the more readily accessible records for the species on the Atlantic slope.

Therefore, on reading Professor Fernald's letter, my feeling of responsibility was quite definite. But instinctively being rather unwilling to immediately acknowledge to a carelessness of this character, I was at once led to the first, and the last, resource in all such cases — appropriately known as the "original source." In the Index for Volume 12 of RHODORA under *Juncus* was found "*brachycarpus*, . . . 112," a glance at the nearby Errata showed no reference, and on turning to the appropriate page was to be read: "But at the spring where *Kobresia elachycarpa* Fernald. . . . was first found we paid our respects. . . . to the colony of plant which has already supplied scores of New England herbaria with *Equisetum variegatum* Schleicher, *Triglochin palustris* L., *Calamagrostis neglecta*, *Juncus brachycarpus* (Engelm.) Buchenau and *J. alpinus* Vill." Truly a notable association of northern types among which to find *Juncus brachycarpus*, a plant characteristic of the Mississippi valley and so very local east

of the Alleghenies, but a casual and uncritical reading (by how very many more than myself!), coupled with a general and not an intimate knowledge of the plants of Maine, had allowed this to pass without comment. The author citation (which on mere reading would of course escape all but the specialist) makes it perfectly clear that the plant referred to is *Juncus brachycephalus*. But that possibly others, hapless, referring to "*Juncus brachycarpus*" at Fort Fairfield, Maine, may not have the excuse that the error was never corrected, let this be put down:

RHODORA, Vol. 12, page 112, line 28; for *brachycarpus* read *brachycephalus*.

ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

WOOL-WASTE PLANTS AT WESTFORD, MASSACHUSETTS.—The following plants found during the summer of 1915, mostly in a wool-waste dump, have been identified at the Gray Herbarium by Dr. B. L. Robinson and J. F. Macbride.

It is the custom of the Worsted Co. to obtain all of their wool and camel's hair from southern Europe and Asia. Two years ago, when it was difficult to obtain foreign wool, a small amount of United States wool was purchased. Yet by careful inquiry I do not learn that any wool-waste has been placed in this dump for five years. This may raise a question in regard to the introduction here of some plants which are natives of this country, when only foreign plants would be expected. For instance, I found two mallows, *Anoda triangularis* (Willd.) DC., and *Sphaeralcea Munroana* (Dougl.) Spach., the former a native of the southwestern United States and the latter common in the Rocky Mountains and portions of the Northwest.

In RHODORA, XV. 172 (1913) I reported *Erodium ciconium* L. from this dump. Last summer I collected a rather poor specimen with only imperfect fruit, which was determined for me as probably a form of *Erodium ciconium* (L.) Ait., var. *tenuisectum* Nym. There is no very authentic material of this variety in the Gray Herbarium and my specimen differs slightly from the descriptions available: The typical form and var. *tenuisectum* Nym. are covered with a fine glandular pubescence while my specimen is only puberulent without glandular hairs.

Another plot of ground in our village yielded two interesting plants. This was where a house had burned; the cellar was then filled and seeded to bluegrass and clover. *Silene antirrhina* L., the sleepy catchfly, appeared in several places, and also *Hyoscyamus niger* L., the Black Henbane, a common European weed, poisonous to pigs. The last edition of Gray's Manual reports it as occurring in America from "Quebec and Maine to New York and Michigan." Though it has been found from time to time in eastern Massachusetts it does not seem to persist in this region. See Fernald, RHODORA, xii. 191, and Deane, RHODORA, xii. 215.—EMILY F. FLETCHER, Westford, Massachusetts.

THE AUTHORITY FOR THE BINOMIAL NYMPHAEA MAGNIFICA.— In the May issue of RHODORA there occurred a misprint which is the more regrettable from the fact that being connected with the publication of a new combination it is likely, if not immediately corrected, to find its way into various reviews, card-catalogues, etc. On this account we wish to record here as early as possible the fact that the note on *Nymphaea magnifica* in RHODORA, xviii. 120, was written by Professor Henry S. Conard, not Conrad, as unfortunately rendered through a typographical error.— ED.

The twenty-second annual FIELD MEETING OF THE JOSSELYN BOTANICAL SOCIETY OF MAINE will be held in Wells and Kennebunk, August 8, 1916, with headquarters at Gleason's Inn, Ogunquit. Announcements will be sent to members and to others on request two weeks previous to the meeting.— DANA W. FELLOWS, Secretary, Portland, Maine.

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THE GENUS SABATIA IN NEW ENGLAND.

M. L. Fernald.

(Plate 121.)

In southern New England the genus *Sabatia* is represented by some of the most beautiful plants of our flora, members of a genus which finds its greatest development on the coastal plain southward. The writer's propensity for northern exploration had taken him for many summers to regions beyond the range of the genus and it was not until the summer of 1913 that he first saw any of the plants growing: the beautiful slender *S. campanulata* (L.) Torr. or *S. gracilis* (Michx.) Salisb. and the splendid large-flowered plant which in Massachusetts has always passed as *S. chloroides* (Michx.) Pursh or recently as *S. dodecandra* (L.) BSP.

The material of *S. campanulata* collected by the writer on peaty and sandy pond-shores at Barnstable on Cape Cod is quite like the Nantucket plant and specimens collected by others (Williams, Greenman, Sinnott, Faxon) at Barnstable. This plant has for some reason been considered as possibly *S. stellaris* Pursh or as transitional to *S. stellaris* and it was mentioned by Gray in the *Synoptical Flora* as "an ambiguous form." This confusion of the two species arose presumably through over-emphasis on the length of the calyx-lobes and the style-branches and the breadth of the leaves, characters which, as well pointed out by Bicknell,[1] "are unstable in a very marked degree." Mr. Bicknell, however, notes two characters which the writer has independently observed as sound, and the words of the former may be

[1] Bicknell, Bull. Torr. Bot. Cl. xlii. 31 (1915).

appropriately quoted: "Much less so [unstable] are two other characters which, indeed, seem to be almost always sharply distinctive although they have been little emphasized in descriptions. In *S. stellaris* the main leaves, broadest at or above the middle, are distinctly narrowed to the base and the usually acute apex, and the entire plant, unless carefully pressed, readily turns black in drying. *Sabatia campanulata*, on the contrary, shows little or no discoloration on the herbarium sheet, and the commonly obtuse leaves, linear, linear-oblong, oval or, low on the stem, actually ovate, are broadly sessile or subclasping."

Besides the excellent distinctive characters pointed out by Bicknell there are some others which seem equally important. *S. stellaris* is a plant of saline or brackish marshes and all the specimens examined by the writer from throughout the range, from Massachusetts to eastern Mexico, are annual (or possibly biennial). *S. campanulata*, on the other hand, is at least in Massachusetts a plant of fresh sandy pondshores or sphagnous bogs, and such labels from the southern states as indicate habitats read: "low, grassy pine barrens and meadows," "damp pine barrens," etc., indicating that the New England habitat of the plant is not unique. Furthermore, all the material of *S. campanulata* which has been carefully collected shows it to be a slightly caespitose perennial with a short subligneous rhizome. The majority of specimens, merely picked or pulled, have no roots but seem to have been broken from a crown. One other character, not so constant, but fairly reliable, is in the bracting of the lateral peduncles. In well developed *S. stellaris* all the peduncles are naked; in well developed *S. campanulata* the lateral peduncles usually bear 1 or 2 median bracts.

As already emphasized *Sabatia campanulata* is a plant of the fresh sandy or peaty shores and marshes. In New England it is very local, seen by the writer only from three regions of Massachusetts: Nantucket Island; the borders of Mary Dunn's Ponds in Barnstable on Cape Cod; and a single station, Pembroke in Plymouth County, where it was collected on September 10, 1884, by W. L. Foster. It was reported by the late Alfred W. Hosmer [1] from a single station in Concord, Massachusetts, but the writer has not seen Mr. Hosmer's material. Its presence as an indigenous plant in Concord is open to some question owing to the transplanting activities of the late Minot Pratt, but the occurrence in Concord or adjacent towns of such

[1] Rhodora, i. 224 (1899).

characteristic coastal plain species as *Sparganium lucidum*, *Sagittaria teres*, *Scirpus Longii*, and *Utricularia resupinata*, lends weight to the possibility that the Sabatia is also indigenous.

Sabatia stellaris, the halophytic annual, is little known in New England east of the western shores of Narragansett Bay. It is on the marshes of Martha's Vineyard and locally at Dartmouth, Massachusetts. The writer has seen no material from east of Buzzard's Bay, but there is a report of the plant at Amesbury and Salisbury at the mouth of the Merrimac,[1] and an old record of it at York, Maine.[2] The latter record is unsupported by specimens though there may originally have been material; but Mr. Sears's record of the plant from Amesbury and Salisbury was based on a single specimen now preserved in the herbarium of the Peabody Academy of Science. Through the kindness of Professor A. P. Morse the writer has examined this plant which was found on September 22, 1885, by Mr. Eben True whose communication states that he found but a single plant in a hay field. The specimen is not *S. stellaris* but very characteristic *S. angularis* (L.) Pursh; and its occurrence as a single individual in a planted field indicates that it was only a casual adventive. In his note Mr. Sears refers to *S. stellaris* as found at Pembroke, Massachusetts; but the plant upon which the Pembroke record was based is Mr. Foster's specimen of *S. campanulata* above referred to.

Besides *S. angularis*, just referred to as casually adventive in New England, the related *S. campestris* Nutt. has occasionally been found as a casual in fields and waste places, but it has not, apparently, become established in New England.

The other two species of New England are the larger-flowered plants which generally pass as *Sabatia dodecandra* (L.) BSP. or *S. chloroides* (Michx.) Pursh. *S. dodecandra* was based on *Chironia dodecandra* L. Sp. Pl. i. 190 (1753) which in turn went back to "*Gentiana floribus duodecim-petalis*," etc. of Gronovius, Virg. 29 (1739). The latter, based upon Clayton's no. 120 from Virginia was described as having the corolla-lobes "lanceolate" and Mr. S. F. Blake, who has examined the specimen, reports the corolla-lobes to be only 5 mm. wide. Later, in the Systema, ed. 12, 267 (1767), Linnaeus transferred his *Chironia dodecandra*, without additional characterization, to the Old World genus *Chlora;* and in 1803 Michaux described from New York and

[1] J. H. Sears, Rhodora, x. 43 (1908).
[2] Goodale, Proc. Portl. Soc. Nat. Hist. i. 60 (1862).

New Jersey as *Chironia chloroides* a plant with "floribus 7–13-partitis" and corolla-lobes "oblong," but with *Chlora dodecandra* L. cited as a synonym, the name presumably changed on account of the lack of precision in the Linnean specific name.

This species, *Sabatia dodecandra*, occurs in coastal marshes from Long Island southward, and judging by herbarium labels and local records it is commonly a plant of saline or brackish marshes. Thus Torrey, who gives a beautiful plate of the plant, ascribes it to "Brackish bog meadows on the Island of New-York, and on Long Island. August;" [1] Taylor, writing of the region from Connecticut to southern New Jersey, says: "In tidal marshes throughout the range; so far not reported inland, nor up the tidal rivers, except in Cape May" [2]; and Stone, writing of southern New Jersey, says: "Frequent on the brackish meadows from the Hackensack marshes south. In the Cape May peninsula it occurs also in fresh marshes over a mile from the coast. . . . *Fl.*—Late July to late August." [3] This plant, usually of brackish marshes, is apparently a perennial (but herbarium specimens very inadequately display the base) and it ranges from 0.8–6 dm. in height; its leaves are nearly uniform up to the inflorescence, oblong to oblong-lanceolate, blunt or acutish; the calyx-lobes are herbaceous or foliaceous, 3–5-nerved, 6–17 mm. long, 1–3 mm. broad, and the calyx-tube is somewhat nerved or corrugated; the corolla-lobes are narrowly oblong-spatulate to oblanceolate, acutish or obtuse, 1.5–2.5 cm. long, 4–9 mm. wide (in dried specimens), with the margins not overlapping; the yellow spot at the base of each segment is elongate, slightly 3-lobed at summit or subentire, and 0.7–2.3 mm. broad.

Whether or not *Sabatia dodecandra* actually occurs in New England is at present an open question. Three stations are recorded in Connecticut: "Rare. Marshes near the coast: Old Lyme (F. H. Dart), Saybrook (Berzelius Catalogue), Guilford (Miss K. Dudley)." [4] Of the Lyme station Dr. C. B. Graves writes, that it was found by Dr. Dart "a good many years ago." Dr. Graves has no material and the colony is now extinct. The Saybrook station was reported in the Berzelius Catalogue, but Mr. A. F. Hill has kindly sent me the entire representation of the species from the Eaton Herbarium and the

[1] Torr. Fl. N. Y. ii. 114, t. 84 (1843).
[2] Taylor, Fl. Vic. N. Y. 504 (1915).
[3] Stone, Pl. So. N. J. 640 (1912).
[4] Graves et al., Cat. Fl. Pl. and Ferns Ct. 319 (1910).

Saybrook station is unrepresented. Similarly, recent collections from Guilford do not show any large-flowered Sabatia there. The plant may now be extinct in Connecticut and until actual specimens can be examined we cannot tell whether the records rest upon true *S. dodecandra* (which is probable) or upon the commoner New England representative of it.

In southeastern Massachusetts no large-flowered Sabatia is known to the writer in brackish marshes, although *S. dodecandra* is to be sought in the Buzzard's Bay region. In Norfolk, Plymouth, Bristol and Barnstable Counties a large Sabatia, which has been passing as *S. dodecandra,* is common and so invariably a plant of damp sandy or peaty margins of fresh ponds or of acid sphagnous bogs, that the Massachusetts botanist, supposing his plant to be *S. dodecandra,* is naturally impressed by Dr. Stone's obvious surprise at finding on the Cape May peninsula *S. dodecandra* "in fresh marshes over a mile from the coast." The Massachusetts plant is rarely if ever found on the actual coast; at least all the herbarium-labels indicate fresh habitats and a majority of the stations are from five to ten miles from the nearest salt water. In many morphological characters the plant of the fresh pond-shores of Massachusetts (and likewise of southern Rhode Island) departs from the somewhat halophytic *S. dodecandra.* The Massachusetts plant is freely stoloniferous, even at the beginning of the flowering season carefully collected specimens exhibiting elongate stolons with well-developed rosettes of acuminate leaves; the plant is taller (2.5–8 dm. high); the basal leaves are oblanceolate and acuminate, distinctly longer than the firm lance-acuminate subulate-tipped cauline ones; the calyx-lobes are firm and linear-subulate, not foliaceous, with slightly hyaline margin, very obscurely 1–3 nerved, 5–15 mm. long, 0.5–1.5 mm. broad, and the calyx-tube nerveless; the corolla-lobes are cuneate-obovate, rounded or emarginate at summit, 1.5–3 cm. long, 6–15 mm. broad, with the margins commonly meeting or overlapping, so that the expanded flower suggests the head of a single *Dahlia* or *Cosmos.* The yellow spot at the base of each lobe is much broader than in *S. dodecandra* (2.5–5 mm. broad) and commonly has 3 long pointed lobes, so that the complete brown-bordered yellow central star of the flower has 21–36 rays. This plant of the Massachusetts pond margins begins flowering in June — some weeks earlier than *S. dodecandra,* apparently,— and is in its prime through July, although belated or small secondary flowers may be found through

the autumn, especially on plants which have been broken off by the omnivorous flower-picker.

In short, the plant of fresh pond-shores of southeastern Massachusetts and southern Rhode Island is quite distinct from the often halophytic *S. dodecandra*. Its nearest affinity seems to be rather with the elegant *S. decandra* (Walt.) Harper which occurs about pine-barren ponds of Georgia, Florida and Alabama and which has a similar calyx and the round-tipped corolla-lobes of the Massachusetts plant; but in *S. decandra* the corolla-lobes are more spatulately narrowed to base and with a comparatively slender yellow spot, the calyx-lobes are much longer, and the plant is nonstoloniferous (apparently biennial), with mostly round-tipped basal leaves. The chief diagnostic characters of these three species are brought out in Plate 121, kindly prepared by Mr. F. Schuyler Mathews.

So far as the writer can determine, the plant of Massachusetts and Rhode Island has not heretofore been distinguished and it is a great pleasure to be able to associate with this splendid species the name of the scholarly New England botanist and sympathetic friend of all botanists, Dr. George Golding Kennedy. The New England plant may, therefore, be called

Sabatia **Kennedyana**, n. sp. Perennis valde stolonifera, stolonibus flagelliformibus apice rosulatis; caule florifero solitario 2.5–8 dm. alto; foliis basilariis anguste oblanceolatis acuminatis 3–8 cm. longis 4–15 mm. latis; foliis caulinis 5–11-jugis (rarissime ternatis) firmis lanceolato-acuminatis basi sessilibus vel subamplexicaulibus apice mucronatis; floribus 1–16 longe pedunculatis apud examplara nunquam mutilata 3–7 cm. latis; tubo calycis campanulato-hemisphaerico enervato, lobis calycis 7–12 lineari-subulatis nec foliaceis obscure 1–3-nervatis 5–15 mm. longis 0.5–1.5 mm. latis margine hyalinis; lobis corollae roseis 7–12 cuneato-obovatis apice rotundatis vel emarginatis 1.5–3 cm. longis 6–15 mm. latis, macula basilari lutea brunneo-marginata late oblonga vel cuneato-obovata subtruncata 3-lobata 5–9 mm. longa 2.5–5 mm. lata; antheris 7–12; stylo stigmatibusque subaequantibus; capsula breviter ellipsoidea 6–10 mm. longa apice rotundata vel emarginata, valvulis hyalino-marginatis — Sandy or peaty margins of fresh ponds or in sphagnous bogs, Massachusetts and Rhode Island. Massachusetts: Great Pond, South Weymouth, September 11, 1903, *Lillian Woodbury:* border of pond, Scituate, September 20, 1914, *F. F. Forbes;* beach of Snake Pond, Kingston, October 25, 1914, *Fernald;* Plymouth, *Oakes et al.;* sandy shore of Clear Pond, Plymouth, August 30, 1913, *Fernald, Hunnewell & Long*, no. 10,219; damp sandy beach of Boot Pond, Plymouth, September 6, 1913, *Fernald, Hunnewell & Long*, no. 10,220; sandy shore of Cooper's Pond, Carver, August 30, 1913, *Fernald, Hunnewell & Long*, no.

10,218; Nemasket River near Lake Assawampsett, Lakeville, August 10, 1887, *C. H. Morss;* damp sandy shore of Loon Pond, Lakeville, August 26, 1913, *Fernald & Long*, no. 10,216; sandy shore of Clear Pond, Lakeville, August 26, 1913, *Fernald & Long*, no. 10,217; Taunton, 1883, *Mrs. H. D. Wilmarth;* wet, sandy border of North Watuppa Lake, Fall River, August 15, 1913, *S. N. F. Sanford* (plant with whorls of 3 and 4 leaves); wet sandy border of cranberry-bog, Dartmouth, August 24, 1908, *S. N. F. Sanford;* borders of ponds, Centreville, Barnstable, July 16, 1899, July 20, 1900, *Clara Imogene Cheney;* shore of Wequawket Pond, Centreville, Barnstable, July 4, 1896, *E. F. Williams* (TYPE in Gray Herb.); Nine Mile Pond, Barnstable, September 4, 1898, *Greenman, Williams;* damp sandy beach of Dennis Pond, Yarmouth, September 19, 1913, *Fernald & Long*, no. 10,222; shore of Long Pond, Yarmouth, August 19, 1907, *E. W. Simnott;* Brewster, August 31, 1914, *F. S. Collins*, no. 3,194; margin of bog, Harwich, July 6, 1912, *F. S. Collins*, no. 1,497; damp sandy and peaty margin of Emery Pond, Chatham, September 9, 1913, *Fernald & Long*, no. 10,221; shallow water, Crystal Lake, Orleans, August 22, 1901, *H. P. Wilson;* shore of Meetinghouse Pond, Eastham, July 28, 1907, *F. S. Collins*, no. 357. RHODE ISLAND: shore of Gorton's Pond, Apponaug, August 18, 1886, *J. F. Collins;* shore of Worden's Pond, South Kingston, *Thurber et al.*

Forma **candida**, n. f., lobis corollae albis, macula basilari nec brunneo-marginata.— At scattered stations throughout the range. TYPE: Weymouth, Massachusetts, August 8, 1905, *Miss Underwood* (Gray Herb.).

Of the Weymouth station Mrs. Clark wrote in RHODORA, vii. 38 (1905): "there are hundreds of the plants none of which show the slightest tinge of pink in the flowers. No typical pink flowers can be found nearer than at a pond in South Weymouth, fully three miles away, where....all....have borne pink flowers. The white form shows no constant differences from the type except in color. The petals are not greenish nor creamy, but a very pure white, and the brown markings usually found at the 'eye' of the pink flowers are wanting in the white form the centre of which is a delicate green or yellow color. The plants seem larger and more vigorous than those of the type....On two sides of the large pond the white flowers are massed so closely together that when seen from the street they bring to mind a field of daisies in early summer."

The very striking albino of *S. campanulata* seems not to have had a convenient designation and it may be called

S. CAMPANULATA (L.) Torr., forma **albina**, n. f., lobis corollae albis. — Occasional throughout the range of the species. TYPE: peaty margin of Small Pond, Barnstable, Massachusetts, July 31, 1913, *Fernald*, no. 10,224 (Herb. New Engl. Bot. Cl.).

The white-flowered form of *S. stellaris* is forma *albiflora* Britton, Bull. Torr. Bot. Cl. xvii. 125 (1890).

GRAY HERBARIUM.

EXPLANATION OF PLATE 121.

(All figures × 1).

SABATIA KENNEDYANA. 1 and 2. Base and portion of inflorescence of the type specimen from Centerville, Massachusetts, *E. F. Williams.* 3. Fruit from Loon Pond, Lakeville, Massachusetts, *Fernald & Long*, no. 10,216.

S. DODECANDRA. 4 and 5. Flower and fruit from Hackensack Marshes, New Jersey, *D. C. Eaton.*

S. DECANDRA. 6, 7 and 8. Basal rosette, flower and fruit from Sumter Co., Georgia, *Harper*, no. 461.

NOMENCLATORIAL TRANSFERS.

L. H. BAILEY.

IN the compiling of the Standard Cyclopedia of Horticulture, it is the intention to avoid the making of new combinations in the names of plants. Unavoidably, a relatively very small number of new combinations have arisen, mostly of horticultural varieties and species of minor importance; it is the purpose to make a separate dated list of these when the work is completed. In Vols. V and VI, however, it has been necessary to make an unusual number and some of them affect North American species; and it has seemed best to publish some of them in advance.

In some of this work I have had the aid of F. Tracy Hubbard, and a number of the combinations are his, as indicated in every case.

It has been the desire, in the compilation of the Cyclopedia, to accept new generic limitations with caution. The temper of the present time is to find differences, as opposed to the tendency of the immediately preceding workers to find agreements. The analytic intention is the mark of systematic work in this generation as the synthetic intention was the mark of the past generation. There is reason to expect a return from the method of disunion to the method of relationships; and as a work designed for the use of horticulturists,

who cannot be skilled in bibliography and pedantry, should be conservative, I have thought it best, so far as possible, to avoid unnecessary and fantastic subdivisions.

Polyscias.

The cultivated Aralias, particularly those of the greenhouses and conservatories, are much confused, due to imperfect descriptions and to the fact that the plants rarely bloom, as well as to the fact that some of them are dimorphous in foliage and also very variable. The florists' Aralias with digitate leaves are apparently Dizygothecas; those with pinnate leaves may be referred, pending completer study, to Polyscias, as follows:

Polyscias Guilfoylei (Bull), comb. nov. *Aralia Guilfoylei* Bull, Cat. 1873, and Hort. *Nothopanax Guilfoylei* (Bull) Merrill, Philip. Journ. Sci. (Bot.), vii. 242 (1912).

Polyscias Guilfoylei (Bull) Bailey, var. **laciniata** (Hort.), comb. nov. *Panax laciniatum* Hort.

Polyscias Guilfoylei (Bull) Bailey, var. **monstrosa** (Hort.), comb. nov. *Aralia monstrosa* Hort. *Panax monstrosum* Hort.

Polyscias Guilfoylei (Bull) Bailey, var. **Victoriae** (Rod.), comb. nov. *Panax Victoriae* Rod., Illustr. Hortic. xxxi. 75, t. 521 (1884). *Aralia Victoriae* Hort. *Nothopanax fruticosum* (L.) Miq., var. *Victoriae* Merrill, Fl. Manila, 358 (1912).

Polyscias Balfouriana (Hort. Sander), comb. nov. *Aralia Balfouriana* Hort. Sander. *Panax Balfouri* Hort. Sander.

Polyscias filicifolia (Moore), comb. nov. *Aralia filicifolia* Ch. Moore, Illustr. Hortic. xxiii. 72, t. 240 (1876). *Panax filicifolium* Hort.

Polyscias fruticosa (L.) Harms, var. **plumata** (Hort.), comb. nov. *Panax plumatum* Hort. *Nothopanax fruticosum* (L.) Miq., var. *plumatum* (Hort.) Merrill, Fl. Manila, 358 (1912).

Pyrus.

It has seemed best, for the purpose of the Cyclopedia, to retain Malus in Pyrus, and this results in a number of important transfers. The new names of native and oriental crab-apples have been made

mostly under Malus. I have been unable to foresee any real gain to accrue from the separation, at least in a horticultural work.

Pyrus coronaria L., var. **elongata** (Rehd.), comb. nov. *Malus fragrans* Rehd., var. *elongata* Rehd., in Sarg. Trees and Shrubs, ii. 229 (1913). *Malus coronaria* (L.) Mill., var. *elongata* (Rehd.) Rehd., in Mitt. Deutsch. Dendr. Ges., 1914. 261 (1914).

Pyrus glabrata (Rehd.), comb. nov. *Malus glabrata* Rehd., in Sarg. Trees and Shrubs, ii. 225, t. 188 (1913).

Pyrus glaucescens (Rehd.), comb. nov. *Malus glaucescens* Rehd., l. c. ii. 139, t. 157 (1911).

Pyrus lancifolia (Rehd.), comb. nov. *Malus lancifolia* Rehd., l. c. ii. 141, t. 158 (1911).

Pyrus platycarpa (Rehd.), comb. nov. *Malus platycarpa* Rehd., l. c. ii. 227, t. 189 (1913).

Pyrus platycarpa (Rehd.) Bailey, var. **Hoopesii** (Rehd.), comb. nov. *Malus platycarpa* Rehd., var. *Hoopesii* Rehd., l. c. ii. 227 (1913).

Pyrus angustifolia Ait., var. **puberula** (Rehd.), comb. nov. *Malus coronaria* Mill., var. *puberula* Rehd., l. c. ii. 229 (1913). *Malus angustifolia* Mill., var. *puberula* (Rehd.) Rehd., in Mitt. Deutsch. Dendr. Ges., 1914. 261 (1914).

Pyrus bracteata (Rehd.), comb. nov. *Malus bracteata* Rehd., in Sarg. Trees and Shrubs, ii. 230 (1913).

Pyrus ioensis (Wood) Bailey, var. **Bushii** (Rehd.), comb. nov. *Malus ioensis* (Wood) Britt., var. *Bushii* Rehd., l. c. ii. 232 (1913).

Pyrus ioensis (Wood) Bailey, var. **spinosa** (Rehd.), comb. nov. *Malus ioensis* (Wood) Britt., var. *spinosa* Rehd., l. c. ii. 231 (1913).

Pyrus ioensis (Wood) Bailey, var. **texana** (Rehd.), comb. nov. *Malus ioensis* (Wood) Britt., var. *texana* Rehd., l. c. ii. 142 (1911).

Pyrus ioensis (Wood) Bailey, var. **Palmeri** (Rehd.), comb. nov. *Malus ioensis* (Wood) Britt., var. *Palmeri* Rehd., l. c. ii. 142 (1911).

Pyrus ioensis (Wood) Bailey, var. **creniserrata** (Rehd.), comb. nov. *Malus ioensis* (Wood) Britt., var. *creniserrata* Rehd., l. c. ii. 231 (1913).

Pyrus atropurpurea (Britt.), comb. nov. *Aronia atropurpurea* Britt., Man. Fl. N. States and Can. 517 (1901). *Pyrus arbutifolia* L. f., var. *atropurpurea* Robins., in Rhodora, x. 33 (1908).

Pyrus Halliana (Koehne) Voss, var. **Parkmanii** (Temple), comb. nov. *Pyrus Malus* L., var. *Parkmanii* Temple, in Gard. Mo., xxix. 35 (1887). *Malus floribunda* Sieb., var. *Parkmannii* (Temple) Koidz.,

in Tokyo Bot. Mag., xxv. 76 (1911). *Malus Halliana* Koehne, forma *Parkmanii* (Temple) Rehd., in Sarg., Pl. Wils., ii. 286 (1915).

Pyrus prunifolia Willd., var. **Rinki** (Rehd.), comb. nov. *Malus prunifolia* (Willd.) Borkh., var. *Rinki* Rehd., in Sarg., Pl. Wils., ii. 279 (1915).

Pyrus theifera (Rehd.), comb. nov. *Malus theifera* Rehd., in Sarg., l. c. ii. 283 (1915).

Pyrus theifera (Rehd.) Bailey, var. **rosea** (Rehd.), comb. nov. *Malus theifera* Rehd., var. *rosea* Rehd., l. c. ii. 284 (1915).

Pyrus transitoria Batalin, var. **toringoides** (Rehd.), comb. nov. *Malus transitoria* (Batalin) Schneid., var. *toringoides* Rehd., l. c. ii. 286 (1915).

Pyrus micromalus (Makino), comb. nov. *Malus micromalus* Makino, in Tokyo Bot. Mag., xxii. 69 (1908).

Pyrus Sieboldii Regel, var. **arborescens** (Rehd.), comb. nov. *Malus Sieboldii* (Regel) Rehd., var. *arborescens* Rehd., in Sarg., Pl. Wils., ii. 294 (1915).

Pyrus Sieboldii Regel, var. **calocarpa** (Rehd.), comb. nov. *Malus Sieboldii* (Regel) Rehd., var. *calocarpa* Rehd., l. c. ii. 294 (1915).

Pyrus pulcherrima Aschers. & Graebn., var. **Scheideckeri** (Spaeth), comb. nov. *Pyrus Scheideckeri* Spaeth, Cat. 1888. *Malus Scheideckeri* (Spaeth) Zabel, in Beissn., Schelle & Zabel, Handb. Laubh. Benenn. 188 (1903).

Pyrus pulcherrima Aschers. & Graebn., var. **Arnoldiana** (Rehd.), comb. nov. *Malus floribunda* Sieb., var. *Arnoldiana* Rehd., Möller's Deutsch. Gärtn.-Zeit. xxiv. 27 (1909).

Other Genera.

Sabal exul (Cook), comb. nov. *Inodes exul* Cook, U. S. Dept. Agric., Bur. Pl. Ind., Circ. 113, p. 14 (1913).

Roripa indica (L.), comb. nov. *Sisymbrium indicum* L., Mant. 93 (1767). *Nasturtium indicum* (L.) DC., Syst. ii. 199 (1821).

Prunus salicina Lindl., var. **pubipes** (Koehne), comb. nov. *Prunus triflora* Roxbg., nomen nudum, and Hort., var. *pubipes* Koehne, in Sarg. Pl. Wils. i. 280 (1912).

Prunus domestica L., var. **insititia** (L.), comb. nov. *Prunus insititia* L., Cent. Pl., i. 12 (1755). *P. domestica* L., subsp. *insititia* (L.) Schneider, Ill. Handb. Laubh. i. 630 (1906).

Passiflora Parritae (Masters), comb. nov. *Tacsonia Parritae* Masters, in Gard. Chron. Ser. II. xvii. 218 (1882).

Passiflora Jamesonii (Masters), comb. nov. *Tacsonia Jamesonii* Masters, in Martius, Fl. Bras., xiii. pt. 1. 537 (1872).

Passiflora mollissima (HBK), comb. nov. *Tacsonia mollissima* HBK., Nov. Gen. et Sp., ii. 144 (1817).

PAEONIA SUFFRUTICOSA Andrews, var. **rubro-plena** (Hort.), comb. nov. *Paeonia Moutan* Sims, var. *rubro-plena* Hort.

PAEONIA SUFFRUTICOSA Andrews, var. **roseo-superba** (Hort.), comb. nov. *Paeonia Moutan* Sims, var. *roseo-superba* Hort.

PAEONIA SUFFRUTICOSA Andrews, var. **vittata** (VanHoutte), comb. nov. *Paeonia Moutan* Sims, var. *vittata* VanHoutte, Fl. de Serr., vii. t. 747. (1852).

PAEONIA SUFFRUTICOSA Andrews, var. **papaveracea** (Andrews), comb. nov. *Paeonia papaveracea* Andrews, Bot. Rep., vii. t. 463. *Paeonia Moutan* Sims, var. *papaveracea* K. C. Davis, in Bailey, Cyclo. Amer. Hort., iii. 1190 (1901).

PAEONIA SUFFRUTICOSA Andrews, var. **Banksii** (Hort.), comb. nov. *Paeonia Moutan* Sims, var. *Banksii* Hort.

PAEONIA SUFFRUTICOSA Andrews, var. **Humei** (Hort.), comb. nov. *Paeonia Moutan* Sims, var. *Humei* Hort.

PAEONIA SUFFRUTICOSA Andrews, var. **rosea** (Lodd.), comb. nov. *Paeonia Moutan* Sims, var. *rosea* Lodd. Bot. Cab., xi. t. 1035 (1825).

STATICE AND LIMONIUM.

Linnaeus in Species Plantarum united the Statice and Limonium of Tournefort. According to the International Rules, Section 6, Article 45, as pointed out by Mr. Blake in RHODORA xviii. 55 (1916), when the genus was divided the name Statice should be retained in the Tournefort sense as that is the origin of the name; or in other words Statice is properly applied to the capitate species, later segregated by Willdenow as Armeria, and the other species with an open inflorescence should retake the Tournefort name of Limonium, which is the treatment adopted by Miller in Gardener's Dictionary, edition 8. This reinstatement of the Miller treatment makes necessary the following new combinations:

STATICE ARMERIA L., var. **alba** (Hort.) Hubb., comb. nov.

Armeria vulgaris Willd., var. *alba* Hort. and Bailey, Stand. Cycl. Hort. i. 395 (1914).

Statice Armeria L., var. **grandiflora** (Hort.) Hubb., comb. nov. *Armeria vulgaris* Willd., var. *grandiflora* Hort. ex Bailey, l. c. i. 395 (1914).

Statice Armeria L., var. **Laucheana** (Voss) Hubb., comb. nov. *Armeria maritima* Willd., forma *Laucheana* Voss., Vilm. Blumengärtn., ed. 3, i. 617 (1896). *A. vulgaris* Willd., var. *Laucheana* Voss. ex Bailey, l. c. i. 395 (1914).

Statice Armeria L., var. **purpurea** (Hort.) Hubb., comb. nov. *Armeria vulgaris* Willd., var. *purpurea* Hort. ex Bailey, l. c. i. 395 (1914).

Statice Armeria L., var. **rubra** (Hort.) Hubb., comb. nov. *Armeria vulgaris* Willd., var. *rubra* Hort. ex Bailey, l. c. i. 395 (1914).

Statice Armeria L., var. **splendens** (Hort.) Hubb., comb. nov. *Armeria vulgaris* Willd., var. *splendens* Hort. ex Baïley, l. c. i. 395 (1914).

Statice Armeria L., var. **variegata** (Hort.) Hubb., comb. nov. *Armeria maritima* Willd., var. *variegata* Hort.

Statice juncea (Girard) Hubb., comb. nov. *Armeria juncea* Girard, in Ann. Sci. Nat. Ser. III. ii. 324 (1844).

Statice leucocephala (Salzm.) Hubb., comb. nov. *Armeria leucocephala* Salzm. ex Koch, in Flora vi. 712 (1823).

Statice majellensis (Boiss.) Hubb., comb. nov. *Armeria majellensis* Boiss., in DC. Prodr. xii. 685 (1848).

Statice mauritanica (Wallr.) Hubb., comb. nov. *Armeria mauritanica* Wallr., Beitr. i. 217 (1844). *A. cephalotes* Hook., not Schousb., Bot. Mag. t. 4128 (1844).

Statice montana Mill., var. **alba** (Hort.) Hubb., comb. nov. *Armeria alpina* Willd., var. *alba* Hort.

Statice plantaginea All., var. **alba** (Hort.) Hubb., comb. nov. *Armeria plantaginea* Willd., var. *alba* Hort.

Statice plantaginea All., var. **gigantea** (Hort.) Hubb., comb. nov. *Armeria plantaginea* Willd., var. *gigantea* Hort.

Statice plantaginea All., var. **grandiflora** (Hort.) Hubb., comb. nov. *Armeria plantaginea* Willd., var. *grandiflora* Hort.

Statice plantaginea All., var. **leucantha** (Boiss.) Hubb., comb. nov. *Armeria plantaginea* Willd., var. *leucantha* Boiss., in DC. Prodr. xii. 683 (1848).

Statice plantaginea All., var. **rosea** (Hort.) Hubb., comb. nov. *Armeria plantaginea* Willd., var. *rosea* Hort.

Statice plantaginea All., var. **rubra** (Hort.) Hubb., comb. nov. *Armeria plantaginea* Willd., var. *rubra* Hort.

Statice plantaginea All., var. **splendens** (Hort.) Hubb., comb. nov. *Armeria plantaginea* Willd., var. *splendens* Hort.

Statice pseudoarmeria Murr., var. **alba** (Hort.) Hubb., comb. nov. *Armeria Cephalotes* Hoffm. & Link, var. *alba* Hort.

Statice pseudoarmeria Murr., var. **grandiflora** (Hort.) Hubb., comb. nov. *Armeria Cephalotes* Hoffm. & Link, var. *grandiflora* Hort.

Statice pseudoarmeria Murr., var. **rubra** (Hort.) Hubb., comb. nov. *Armeria Cephalotes* Hoffm. & Link, var. *rubra* Hort.

Statice pseudoarmeria Murr., var. **splendens** (Hort.) Hubb., comb. nov. *Armeria Cephalotes* Hoffm. & Link, var. *splendens* Hort.

Statice Welwitschii (Boiss.) Hubb., comb. nov. *Armeria Welwitschii* Boiss., in DC. Prodr. xii. 676 (1848).

Limonium collinum (Griseb.) Hubb., comb. nov. *Statice collina* Griseb., Spicil. Fl. Rumel ii. 300 (1844). *S. Besseriana* Friv., not Schult., ex Griseb., l. c. ii. 300 (1844). *Goniolimon collinum* (Griseb.) Boiss., in DC. Prodr. xii. 633 (1848).

Limonium eximium (Schrenk) Kuntze, var. **album** (Hort.) Hubb., comb. nov. *Statice eximium* Schrenk, var. *alba* Hort. *S. eximia* Schrenk, var. *flore-alba* Hort.

Limonium eximium (Schrenk) Kuntze, var. **superbum** (Hort.) Hubb., comb. nov. *Statice eximia* Schrenk, var. *superba* Hort.

Limonium imbricatum (Webb) Hubb., comb. nov. *Statice imbricata* Webb ex Girard, in Ann. Sci. Nat. Ser. III. ii. 330 (1844).

Limonium latifolium (Sm.) Kuntze, var. **album** (Hort.) Hubb., comb. nov. *Statice latifolia* Sm., var. *alba* Hort.

Limonium latifolium (Sm.) Kuntze, var. **roseum** (Hort.) Hubb., comb. nov. *Statice latifolia* Sm., var. *rosea* Hort.

Limonium Perezii (Stapf) Hubb., comb. nov. *Statice Perezii* Stapf, in Ann. Bot. xxii. 116 (1908).

Limonium profusum (Hort.) Hubb., comb. nov. *Statice profusa* Hort., cf. Garden xxxiii. 457 (1885). *S. puberulum* Webb × S. *macrophylla* Brouss. ex Spreng.

Limonium purpuratum (L.) Hubb., comb. nov. *Statice purpurata* L., Mant. 59 (1767).

Limonium purpuratum (L.) Hubb., var. **longifolium** (Thunb.)

Hubb., comb. nov. *Statice longifolia* Thunb., Prodr. Pl. Cap. 54. (1794). *S. purpurata* L., var. *longifolia* (Thunb.) Boiss., in DC. Prodr. xii. 667 (1848).

Limonium sinuatum (L.) Mill., var. **candidissimum** (Hort.) Hubb., comb. nov. *Statice sinuata* L. var. *candidissima* Hort.

Limonium superbum (Regel) Hubb., comb. nov. *Statice superba* Regel, in Gartenfl. xxxiii. 234 (1884). *S. Suworowii* Regel × *S. leptostachya* Boiss.

Limonium superbum (Regel) Hubb., var. **flore-albo** (Benary) Hubb., comb. nov. *Statice superba* Regel, var. *flore-albo* Benary, cf. Gartenfl. xlv. 635 (1896).

Limonium Suworowii (Regel) Kuntze, var. **album** (Hort.) Hubb., comb. nov. *Statice Suworowii* Regel, var. **alba** Hort., cf. Gard. Chron. Ser. III. liii. 426 (1913).

Limonium tataricum (L.) Mill., var. **angustifolium** (Boiss.) Hubb., comb. nov. *Goniolimon tataricum* (L.) Boiss., var. *angustifolium* Boiss., in DC. Prodr. xii. 633 (1848). *Statice tatarica* L., var. *angustifolium* Hort. *S. Besseriana* Schult., Syst. vi. 789, in text (1820). *S. incana* Bieb., not L., Fl. Taut. Cauc. i. 251 (1808). *S. incana* Bieb., var. *hybrida* Hort.

Limonium tataricum (L.) Mill., var. **coccineum** (Hort.) Hubb., comb. nov. *Statice incana* Bieb., var. *coccinea* Hort.

Limonium tataricum (L.) Mill., var. **nanum** (Hort.) Hubb., comb. nov. *Statice tatarica* L., var. *nana* Hort. *S. incana* Bieb., var. *hybrida nana* Hort.

Limonium vulgare Mill., var. **album** (Hort.) Hubb., comb. nov. *Statice Limonium* L. var. *alba* Hort.

Limonium vulgare Mill., var. **macrocladum** (Boiss.) Hubb., comb. nov. *Statice Limonium* L., var. *macroclada* Boiss., in DC. Prodr. xii. 645 (1848).

Other Genera.

Berkheya membranifolia (DC.) Hubb., comb. nov. *Stobaea membranifolia* DC., Prodr. vi. 521 (1837).

Berkheya Radula (Harv.) Hubb., comb. nov. *Stobaea Radula* Harv. in Harv. & Sond., Fl. Cap. iii. 491 (1865).

Pseuderanthemum laxiflorum (Gray) Hubb., comb. nov. *Eranthemum laxiflorum* Gray, in Proc. Am. Acad. v. 349 (1862).

Saxifraga diversifolia Wall., var. **foliata** (Engl. & Irmscher) Hubb., comb. nov. *S. diversifolia* Wall., forma *foliata* Engl. & Irmscher, in Notes R. Bot. Gard. Edinb. v. 138 (1912).

Saxifraga moschata Wulf., var. **densa** (Hort.) Hubb., comb. nov. *S. muscoides* Hort., not All. var. *densa* Hort., cf. Irv. & Malb., Saxif. 35 (not dated, about 1911–12). *S. densa* Hort., not Willd.

Saxifraga moschata Wulf., var. **Fergusonii** (Hort.) Hubb., comb. nov. *S. Fergusonii* Hort., cf. Gard. Chron. Ser. III. xxxiii. 340 (1903).

Saxifraga Stracheyi Hook. f. & Thoms., var. **Schmidtii** (Regel) Hubb., comb. nov. *S. Schmidtii* Regel. *Bergenia Schmidtii* Hort. *S. thysanodes* Hort. Haage & Schmidt, not Lindl.

Sedum alboroseum Baker, var. **variegatum** (Mast.) Hubb., comb. nov. *S. erythrostictum* Mast., not Miq., var. *variegatum* Mast., in Gard. Chron. Ser. II. x. 337 (1878). *S. japonicum* Hort., not Sieb., var. *variegatum* Hort. ex Wilh. Mill., in Bailey, Cycl. Am. Hort. iv. 1639 (1902). *S. alboroseum* Baker, var. *foliis variegatis* Regel, in Gartenfl. xxi. 2, t. 709, f. 6 (1872).

Tropaeolum peltophorum Benth., var. **fimbriatum** (Hort.) Hubb., comb. nov. *T. Lobbianum* Veitch, var. *fimbriatum* Hort.

Tropaeolum peltophorum Benth., var. **hederifolium** (Hort.) Hubb., comb. nov. *T. Lobbianum* Veitch, var. *hederifolium* Hort.

Tropaeolum peltophorum Benth., var. **miniatum** (Hort.) Hubb., comb. nov. *T. Lobbianum* Veitch, var. *miniatum* Hort.

Tropaeolum peltophorum Benth., var. **Reginae** (Hort.) Hubb., comb. nov. *T. Lobbianum* Veitch, var. *Reginae* Hort.

NYMPHAEA AND NUPHAR AGAIN.

Henry S. Conard.

It is nearly thirty years since E. L. Greene [1] attacked the validity of the generic names Nymphaea and Nuphar. He "discovered" the fact that Salisbury in 1806 (or 1805) [2] divided into two parts the genus Nymphaea as then understood, giving the name Castalia to the white waterlilies, and retaining Nymphaea for the yellow flowering cow-lilies. It was in 1808 or 1809 that Sir J. E. Smith [3] proposed to retain Nymphaea for the waterlilies, and to call the cow-lilies by their old classic name of Nuphar. Greene, Britten,[4] Lawson [5] and others established the priority of Salisbury's work beyond a possibility of doubt. They also discussed the probable causes for the general acceptance of Smith's generic names, and the neglect of Salisbury's.

For various reasons, however, many botanists have refused to return to Salisbury's generic names. The clearest and strongest argument for the refusal was set forth by Dr. John Briquet in his Prodrome de la Flore Corse (pp. 577–9). In this book, and in a personal letter to the writer, he opposed Salisbury on the basis of Art. 45 of the International Rules of Botanical Nomenclature. This article declares that in dividing a genus, the old name must be retained for that portion containing the largest number of species. Salisbury had acted contrary to this rule. In the course of the argument in the Prodrome, Dr. Briquet further points out that Salisbury's diagnosis of Nymphaea was opposed to the definition of the genus given by Linnaeus in the sixth edition of the Genera Plantarum. In following up the suggestion of Dr. Briquet, facts have come to light, which would seem to settle the controversy conclusively in favor of Smith's nomenclature.

In the fifth edition of the Genera Plantarum (1754), which is taken as the starting point for generic diagnoses (Internat. Rules Art. 19), Nymphaea is defined thus: (p. 227).

Cal. *Perianthium* pentaphyllum s. tetraphyllum, magnum, coloratum, persistens.

[1] Bull. Torr. Bot. Club, **14**: 177; 257; **15**: 84.

[2] König & Sims Ann. of Bot. **2**: 69–76. Salisbury's paper probably appeared in June 1805. The volume was completed in 1806, and is so dated.

[3] Florae Graecae Prodromus, **1**: 360. Exact date of this part uncertain.

[4] Journ. of Bot. Brit. & For. **26**: 6–10.

[5] Trans. Roy. Soc. Canada, Sec. IV. **6**: 97–125.

Cor. *Petala* numerosa (quindecim saepe), calyce minora, germinis lateri insidentia, serie plusquam simplici

* * * * * * * * * * * *

Obs. Calyx & Corolla *quoad numerum & figuram incerta sunt, hinc*

N. lutea *Calyce pentaphyllo, foliolis subrotundis, Petalis minimis.*
N. alba *Calyce tetraphyllo, foliolis ovatis, corollam vix superantibus.*
Nelumbo *Pericarpium turbinatum, truncatum,* etc., etc.

In the description of the other genera in this work, Linnaeus usually did not name any species. In the case of Nymphaea, however, he pointed out in his "Observations," as shown above, that three distinct elements were included in it.

The important differences between these three elements had so impressed Linnaeus in the course of ten years, that he changed the description of the genus in the sixth edition of Genera Plantarum (1764) to read thus: (p. 264).

Cal. *Perianthium* inferum, tetraphyllum, magnum, supra coloratum, persistens.

Cor. *Petala* numerosa (quindecim saepe), germinis lateri insidentia, serie plus quam simplici.

* * * * * * * * * * * *

N. lutea *Calyce pentaphyllo: foliolis subrotundis, Petalis minimis a reliquis differt.*
Nelumbo *Pericarpium turbinatum, truncatum,* etc., etc.

It will be noted that the word *pentaphyllum* is omitted from the description of the calyx, and *calyce minora* is omitted from the description of the corolla. Both of these omitted expressions apply to the *N. lutea* element of the former edition. The description as thus amended applies strictly to the *N. alba* element. This is further emphasized by the words *Cor. germinis lateri insidentia,* referring to the insertion of the petals on the side of the ovary in the white waterlily group. This character does not occur in the cow-lilies, or in the lotus (Nelumbo).

As in the former edition, there was usually no citation of species in the sixth edition of Linnaeus's Genera Plantatum. Here, however, *N. lutea* and *Nelumbo* were named. *N. lutea* was said to "differ" from the others by certain characters. The mention of the two "aberrant" (Briquet, p. 578) elements, and the omission in this edition of the name of the fully described waterlily element, shows that the genus Nymphaea was at this time intended by Linnaeus to

refer to the true waterlilies. He excluded the other two groups, but omitted the coining of a new name for them. Surely this omission cannot invalidate the name of the group which he did accurately describe.

Linnaeus's definition of Nymphaea of the sixth edition of the Genera Plantarum was copied *verbatim* in the various 7th and 8th editions. It was accepted and amplified by Jussieu in his Genera Plantarum (1789). There we read, p. 68,

NYMPHAEA, T. L. **Nenuphar*. Calix multipartitus laciniis multiplice ordine, exterioribus 4–5 extus viridibus, caeteris interioribus (petala T. L.) coloratis, petaloideis. Stamina numerosa, multiplici ordine germinis lateribus affixa; filamenta exteriora latiora et petaloidea; etc., etc.

Jussieu called all of the perianth a calyx, whose inner members are colored and petaloid. The numerous stamens are attached to the sides of the ovary, and the outer have broad, petaloid filaments. All of these characters apply only to the white waterlily group, and not at all to the cow-lilies or the lotus. If, therefore, any doubt remains as to the meaning of Linnaeus's Nymphaea, no doubt can remain regarding Jussieu's. When we add that Adanson in 1763 [1] had separated the genus Nelumbo from the original Nymphaea of Linnaeus (1753–54), we have the facts as they were when Salisbury wrote.

Salisbury in 1805 completed the segregation of the old genus Nymphaea along lines already pointed out by Linnaeus. But he was entirely wrong in applying Linnaeus's amended name Nymphaea to the part of the genus which Linnaeus had definitely excluded from his mature generic characterization, and in coining the new name Castalia for the group, which both Linnaeus and Jussieu had clearly intended in their descriptions of the genus Nymphaea. A comparison of Salisbury's generic diagnosis with those quoted from Linnaeus and Jussieu will show how he reversed the meaning of Nymphaea. He says (König and Sims Ann. of Bot. **2**: 71, 1806),

NYMPHAEA

Calyx 5–6-phyllus, toro insertus, petaloideus. Nectaria 11–16, toro inserta, lamellaria, dorso mellifera. Filamenta 90–160, toro inserta, sub anthesi a pericarpio elastice dissilientia, etc.

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[1] Fam. Pl. **2**: 76.

CASTALIA

Calyx 4–5-phyllus, marginem tori cingens. Petala 20–30, pericarpio a basi usque ad medium inserta. Filamenta 60–150, pericarpio altius inserta, libera, etc.

The facts which we have presented were evidently known to Sir J. E. Smith. In his Florae Graecae Prodromus (1808–09) he approved of Salisbury's division of the old genus Nymphaea, but he showed disapproval of Salisbury's nomenclature by remarking, "at minus bene Nymphaeam antiquorum veram, nomine, Castalia....distinxit." Also, in Rees's Cyclopedia (Vol. 25, Art. Nymphaea) he noted that the difference between the white- and the yellow-flowered groups of Nymphaea were recognized by Linnaeus. Smith was right, therefore, in retaining Nymphaea L. emend., for the white waterlilies, and restoring the old prelinnean name Nuphar for the cow-lily group. For this latter group had not previously received a valid generic name in postlinnean times.

It would be only a technicality to argue that, according to rules of nomenclature accepted in some places, the Linnean genera are not valid because no species are cited as belonging to them. A comparison of the texts of the fifth and sixth editions of the Genera Plantarum shows that *N. alba* is the Nymphaea of ed. 6. And it is generally accepted that ed. 5 is referred to the Species Plantarum of 1753 (Internat. Rules, Art. 37, 38). Furthermore, the International Rules admit a genus as valid if adequately described, regardless of whether any species are mentioned. Thus Nymphaea stands for the white waterlilies, on the authority of Linnaeus 1764.

We must conclude therefore that the valid genera are:

Nymphaea Linn. 1764 = { Nymphaea Linn. 1754 ('53) in part. / Castalia Salisb. 1805–06.

Nuphar Sm. 1808–09 = { Nymphaea Linn. 1754 ('53) in part. / Nymphaea Salisb. 1805, *not* Linn. 1764.

Nelumbo Adans. 1763 = { Nymphaea Linn. 1754 ('53) in part. / Nelumbium Juss. 1789.

GRAY HERBARIUM OF HARVARD UNIVERSITY.

REPORTS ON THE FLORA OF THE BOSTON DISTRICT,— XXIII.

RANUNCULACEAE.

ACTAEA.

A. alba (L.) Mill. Woods, frequent, but not reported south of Hingham.

A. rubra (Ait.) Willd. Woods, occasional from Norwood and Sherborn north and east.

A. rubra (Ait.) Willd., forma **neglecta** (Gillman) Robinson. Georgetown (*Mrs. C. S. N. Horner*, no date); Danvers (*J. H. Sears*, Aug. 11, 1884 et seq.).

ANEMONE.

A. canadensis L. Topsfield, Danvers, Wenham, Swampscott, Lexington, Concord, Newton, Waltham. Introduced at last station, perhaps at others.

A. cylindrica Gray. Dry hillsides and open woods; reported from 14 places north and west of Boston.

A. NEMOROSA L. Persistent and spreading about old S. P. Fowler garden, Danvers (*J. H. Sears*, May 20, 1903; May 6, 1904).

A. quinquefolia L. Meadows and wet open woods; common throughout.

A. riparia Fernald. Limestone shale, in John Peterson's pine grove near bank of Ipswich River (*J. H. Sears*, Aug. 25, 1901; July 1, 1902).

A. virginiana L. Open woods and roadsides; generally distributed, but not reported south of Hingham.

ANEMONELLA.

A. thalictroides (L.) Spach. Moist soil, common, but not reported south of Hingham.

AQUILEGIA.

A. canadensis L. Dry rocky woods and pastures, common throughout.

A. canadensis L., var. **Phippenii** J. Robinson. See Robinson, Fl. Essex Co. 30, 1880. Discovered by Mr. G. D. Phippen in a ravine in Salem pastures about 1844. Salem pastures (*J. Robinson*, May, 1873, specimen in herb. Peabody Academy of Science).

A. VULGARIS L. Garden escape, occasional.

CALTHA.

C. palustris L. Swamps and wet woods, very common throughout.

[CIMICIFUGA RACEMOSA (L.) Nutt. Reported from W. Gloucester in Robinson, Fl. Essex Co. 31, 1880, but no specimens are known to exist.]

CLEMATIS.

C. verticillaris DC. Ledges on Pine Hill, Middlesex Fells (*Robert D. Morss*, May 13, 1903, specimen in Gray Herb.; *Dr. Henry Piper*, May, 1904, specimen in herb. W. Deane); Roxbury (*J. A. Lowell*, May, 1847, specimen in herb. Boston Society of Natural History.

C. virginiana L. Swamps, thickets and roadsides, common throughout.

COPTIS.

C. trifolia (L.) Salisb. Swamps and wet woods, common throughout.

DELPHINIUM.

D. AJACIS L. Rubbish heap in woods, apparently spreading, Middlesex Fells, Stoneham (*F. S. Collins*, Aug. 8, 1885); reported in Dame & Collins, Fl. Middlesex Co. 3, 1888, and in Deane, Fl. Metrop. Park Comm. 5, 1896, as *D. Consolida* L.

HEPATICA.

H. triloba Chaix. Sunny slopes and open woods; common in Essex County, occasional elsewhere.

RANUNCULUS.

R. abortivus L. Woods and meadows, common.

R. abortivus L., var. **eucyclus** Fernald. Deer Leap, Andover (*A. S. Pease*, June 4, 1904); Topsfield (*J. H. Sears*, June 5, 1899; June 1, 1902); ledges, abundant, W. Roxbury (*F. G. Floyd*, June 12, 1902); moist shady woodland, Hyde Park (*F. G. Floyd*, June 17, 1900); low woods, a good-sized colony, Hyde Park (*F. G. Floyd*, June 1, 1902).

R. ACRIS L. Fields and meadows, common throughout.

R. ACRIS L., var. STEVENI (Andrz.) Lange. Boxford, Salem, Melrose, Lexington, Wellesley, Franklin Park [Boston].

R. allegheniensis Britton. Woods and ledges, occasional near Boston and Salem. Apparently common on diorite hills running from Salem to Lexington.

R. aquatilis L., var. **capillaceus** DC. Slow streams and ponds, occasional.

R. BULBOSUS L. Fields and pastures, very common throughout.

R. Cymbalaria Pursh. Salt marshes along the coast, occasional.

R. delphinifolius Torr. Quiet waters; occasional, but no reports from southeastern towns.

R. delphinifolius Torr., var. **terrestris** (Gray) Farwell. Muddy shores; Marblehead, Winchester, Middlesex Fells, Belmont, Concord.

R. fascicularis Muhl. Dry hillsides; common on diorite hills north and west of Boston, rare elsewhere.

R. FICARIA L. Garden escape at Cambridge (*W. Deane*, May 8, 1914); S. Hingham (*H. W. Cushing*, May, 1891, to date).

R. Flammula L., var. **reptans** (L.) Mey. Sandy shores; common in Essex County, occasional in Middlesex County; apparently rare or wanting south of Boston.

R. laxicaulis (T. & G.) Darby. Muddy places, Byfield [Newbury] (*J. H. Sears*, Sept. 18, 1886 et seq.); Sharon (*E. H. Hitchings*, Aug., 1884); Easton (*Oakes Ames*, Aug. 31, 1898).

R. micranthus Nutt. Rocky places; Peabody, Melrose, Stoneham, W. Roxbury, Milton, Sharon; Hingham, according to Bouvé, Botany of Hingham, in History of Hingham, i. pt. 1, 92, 1893.

R. pennsylvanicus L. f. Lawrence, above dam, north side (*J. Robinson*, Aug. 5, 1879); " near Boston " (*Wm. Boott*, Aug. 20, 1853;

Wellesley (collector unknown, June, 1880); Concord, according to Dame & Collins, Fl. Middlesex Co. 2, 1888. This is one of Minot Pratt's introduced plants. See RHODORA i. 171, 1899; Hingham, vide supra.

R. recurvatus Poir. Moist woods; occasional, especially northward.

R. repens L. Moist soil, common throughout.

R. sceleratus L. Wet places near the coast, locally abundant.

THALICTRUM.

T. dasycarpum Fisch. & Lall. Blue Hills Reservation (*G. G. Kennedy*, June 30, 1895, specimen in herb. G. G. Kennedy).

T. dioicum L. Rocky woods; common northward, few reports south of Boston.

T. polygamum Muhl. Meadows and swamps, common throughout.

T. polygamum Muhl., var. **hebecarpum** Fernald. Rich wet loam by brook, Manchester (*F. T. Hubbard*, July 15, 1913).

T. revolutum DC. Dry hillsides and open woods; Blue Hills and Walpole northward, rare.

ZANTHORHIZA.

Z. APIIFOLIA L'Hér. Escaped from cultivation at Salem, Danvers and Concord.

C. H. KNOWLTON, WALTER DEANE } *Committee on Local Flora.*

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F. S. Mathews del.

Figs. 1–3, Sabatia Kennedyana; 4 and 5, S. dodecandra; 6–8, S. decandra.

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DELPHINIUM CONSOLIDA IN AMERICA, WITH A CONSIDERATION OF THE STATUS OF DELPHINIUM AJACIS.

Bayard Long.

For at least a century *Delphinium Consolida* held an almost uninterrupted and an unchallenged place in the introduced flora of America. In 1814 we find Pursh in his *Flora* noting the "common Lark-spur... In fields and woods. Pa. and Va." Nuttall in 1818 in his *Genera* regards it as "naturalized." In Eaton's *Manual of Botany*, as early as the Fifth Edition of 1829, it is also considered "Naturalized." Torrey and Gray in 1838 record it "In fields and along roadsides; introduced from Europe and almost naturalized." In the First Edition of Gray's *Manual* in 1848 we find: "D. Consolida, the common annual Garden Larkspur ... has escaped from gardens into the roadsides in some places."

This "common annual Garden Larkspur" appears to have been invariably described as having smooth capsules in our earlier American botanies, a fact very evidently due to a faithful copying and recopying of European descriptions of *Delphinium Consolida*. In 1859, however, Darby described the plant with "Carpels smooth or pubescent"[1] but apparently not till 1890 in Watson and Coulter's Edition of Gray's *Manual* is it recognized that the pubescent-fruited plant escaping from gardens is *Delphinium Ajacis*, a species well known in Europe. From this time *D. Consolida* shared its place in American treatments with *D. Ajacis*.

[1] Darby, Botany of the Southern States, 207 (1859).

And so through all the standard works, continuing into the First Edition of Britton and Brown's *Illustrated Flora*, the several editions of Britton's *Manual*, Small's *Flora of the Southeastern United States*, *Gray's New Manual*, and many local floras, the right of *Delphinium Consolida* to a place among our introduced plants stood unquestioned, but in 1914 Dr. N. L. Britton in the new edition of the *Illustrated Flora* published this concise statement: "Delphinium Consolida L., a European species which has a glabrous style and capsule, is widely recorded as naturalized in the eastern United States,. . .but all specimens examined prove to be *D. Ajacis*."

A sweeping statement like this, even though from such an authoritative source, always leads one to examine critically the material within his own reach, especially if it has not been a part basis of the original observations. In the present case this was by no means in criticism but for verification, in the regular work of endeavoring to keep somewhat abreast of the botanical times.

The material in the Herbarium of the Academy of Natural Sciences proved, upon the most casual examination, to be without exception *D. Ajacis*. But, to my surprise, in the collection of the Philadelphia Botanical Club two sheets of quite authentic *D. Consolida* were found. The Herbarium of the University of Pennsylvania — well known to hold valuable material supporting old local records — was found to contain two collections of true *D. Consolida*, one being a duplicate of the material already seen in the Philadelphia Botanical Club Herbarium, but the other representing a third and new locality. Search at the Philadelphia College of Pharmacy revealed a fourth collection. After considerable correspondence and much disappointment from both large and small herbaria, a fifth American specimen was found in the herbarium of Mr. E. B. Harger of Connecticut.

From Mr. Harold St. John I have learned that there are no American specimens of the discredited species in the Gray Herbarium. Through the courtesy of Dr. J. M. Greenman the series at the Missouri Botanical Garden has been sent me for examination and I have found it to contain no authentic material of *D. Consolida* from America. From the National Museum at Washington, Mr. Paul C. Standley has written upon my inquiry that after careful examination of their material he was unable to find a single sheet of the species from North America.

Mr. W. W. Eggleston, learning of my search for American *D. Con-*

solida through Mr. Standley, stated that he had seen no United States specimens of this species although he had examined all the material at Cambridge and New York — corroborating Dr. Britton's view and that of Mr. St. John. Mr. Eggleston has been interested in this species (particularly in relation to drug-plant investigations being made by the Department of Agriculture) and on expressing a desire to see the plants which had come to my attention, I sent him the several specimens and have received his verifying determination upon all of them.

To return to this American material of *Delphinium Consolida:*— One of the sheets in the Herbarium of the Philadelphia Botanical Club, collected "on ships ballast below the Pennsylvania Salt Works, Philadelphia" many years ago by that indefatigable ballast-ground specialist, Isaac Burk, is rather of historical interest than of value for the present distribution of the species. The material found at the University of Pennsylvania belongs, certainly in part at least, to the same class. Besides additional specimens of the Burk collection there is material from "Camden, N. J." collected in 1878 by Isaac Martindale. Although actual evidence on the label is lacking, it is in all probability to be associated with the record in Britton's Catalogue of "Camden: On ballast grounds — Martindale."[1] In the Martindale Herbarium at the Philadelphia College of Pharmacy there is a further collection of *D. Consolida* from Camden, New Jersey, made by C. F. Parker in 1882.[2] Curiously enough there appears to be no material here of Martindale's 1878 collection of the plant, but there are several *earlier* collections of what he took to be *D. Consolida.* (These are however *D. Ajacis.*) Evidently considering he already had the species well represented from Camden in his herbarium, he used this 1878 material for purposes of exchange.

But the second specimen in the collection of the Philadelphia Botanical Club, labelled "Grass field — New Egypt, N. J.," proves to be of some import. The habitat was so definitely suggestive of as real an occurrence in our flora as is shown by *D. Ajacis* that the collector, Mr. J. H. Grove of New Egypt, was communicated with. He wrote that he distinctly remembers collecting the plant in 1907, that he has

[1] Britton, Cat. Pl. N. J. 40 (1889).

[2] This material — of three specimens showing both flower and mature fruit — is named *Delphinium divaricatum* Ledeb. on Parker's label, and may possibly bear some relation to the reputed occurrence of this species in America.

since seen it a number of times in the same field, most frequent when the field was sown to grain, but that he had not had occasion to visit the locality during the last several years.

The records in the recent *Catalogue of the Flowering Plants and Ferns of Connecticut* have proved in general to have been so carefully compiled that it was felt advisable to investigate the reported occurrence of *D. Consolida* from several localities in that State. Though the records of Dr. E. H. Eames and Mr. Charles H. Bissell proved to be based upon *D. Ajacis*, through the kindness of Mr. E. B. Harger I was able to examine his specimen from Middlebury, Connecticut, and verify it as authentic *D. Consolida*. His plant is from "newly-seeded grass-land." Unfortunately his business that day, as he explains, was not botanical and he had no opportunity to observe fully the occurrence of the species.

As regards both the New Egypt and the Middlebury locality it can not therefore be asserted with confidence what the exact status of the plant is at the present time, but I think it will be agreed the probabilities are that, in the matter of persistence at a locality, this occurrence of *D. Consolida* is quite as worthy of note as a collection of its near ally, *D. Ajacis*. I feel confident that many stations, upon which an American range for *D. Ajacis* has been determined, would be difficult to verify in the field at the present time. I am inclined to think that the occurrence of this species, like many other garden annuals, is largely due to its continual escaping from gardens rather than its ability in actually establishing itself.

Although *Delphinium Ajacis* seems to be tacitly accepted today by the authors of our manuals as a naturalized plant, investigation into this matter would seem to show that its status as such is not based upon too conclusive or convincing grounds. Without doubt there are scattered localities where the species may be more or less well naturalized, but it seems equally clear that only a small percentage of the specimens to be found in herbaria represent actual cases of naturalization — the great majority, merely casual escapes, the collection of which, if not completely destroying the possibility of a permanent colony, has at least often greatly reduced that possibility.

There is a rather general agreement among the Philadelphia collectors who know *D. Ajacis* outside the garden that its occurrence is commonly that of single or few plants on waste ground, roadsides, railroad banks, and that it rarely tends to form a really permanent

station. Dr. John K. Small, however, in his *Flora of Lancaster County* [Pennsylvania] records the plant as "Rather common in fields and waste places" in the central part of the county. A number of specimens collected about Lancaster offer supporting evidence. Mr. E. G. Vanatta, who has made a collection of some size of the more conspicuous plants about Chestertown, Maryland, reports the species as frequent at a locality near the town, in a field and upon the loose gravel of nearby railroad banks. Mr. David McCadden tells me that the plant is common at one place near Norristown, Pennsylvania, along the sides of a railroad-cut.[1] In the Martindale Herbarium is a specimen of *D. Ajacis* bearing the label "Generally in grain fields, Byberry, [Philadelphia]. Frequent 1862."

On the other hand, correspondence and further communication with numerous Philadelphia collectors, has brought forth in general a rather different expression of opinion than the immediately foregoing. Mr. Stewardson Brown, Conservator of the Herbarium of the Philadelphia Academy, assures me that he has never seen *Delphinium Ajacis* except upon very evident dumps, mixed with other plant rubbish that might have been thrown out of a yard in cleaning up. He has never noted it any more established than Garden Petunias and Nasturtiums. Dr. C. D. Fretz, the authority on the plants of Bucks County, Pennsylvania, writes me that the plant is found occasionally along roadsides in Sellersville and other places. He says, further: "I of course consider it very rare. My impression is that it is not at all naturalized, but merely an escape from gardens." Mr. Harold W. Pretz, who has been energetically engaged for a number of years in thoroughly exploring Lehigh County, Pennsylvania, would accredit it with only a spontaneous occurrence "on or in the vicinity of ash piles on comparatively new dumped ground"[2] and is willing to subscribe to an opinion "that it is not established anywhere in the local region." Mr. Alexander MacElwee, who made extensive collections in the Philadelphia region some years ago and became very familiar with the flora, writes me: "Concerning Delphinium Ajacis I would say *decidedly* that it is not a really naturalized plant in our area — in eastern Pennsylvania or New Jersey. I have occasionally found it in

[1] The railroad has been run through a yard and garden, however, and the Larkspur is continually replenished as an escape from the old garden at the top of the cut.

[2] He makes an interesting suggestion that its behavior would lead one to suspect that it is a plant that depends on newly stirred ground to obtain a footing.

alleys in West Philadelphia, probably originating from old plants which had been thrown over a fence the preceding Fall."

Dr. Witmer Stone, one of the most energetic explorers of southern New Jersey and familiar with many parts of Pennsylvania, recalls having seen only a few roadside plants in Germantown, Philadelphia. Dr. John W. Eckfeldt records a couple of plants with Alfalfa used as a binder on the railroad banks below Haddonfield, New Jersey. Dr. Arthur Jones recalls the plant in some of the old towns of southern New Jersey but always as a rare garden escape or upon dumping grounds.

Professor W. A. Kline of Ursinus College, who is familiar with the Parkiomen Valley, considers it a very rare plant of roadsides or dumps. Mr. Joseph Crawford notes a rare occurrence on dumps and waste ground, often due to the thrown out dead plants of the previous year. Mr. W. H. Leibelsperger, working in Berks County, Pennsylvania, records the species as very rare along roadsides.[1] None of these observers have ever seen the plant anywhere actually naturalized.

Dr. J. M. MacFarlane and Dr. John W. Harshberger of the University of Pennsylvania, both of whom have had wide field experience in the local area, are in agreement that this is a plant never straying far, in their experience, from its source in cultivation, or becoming independently established.

Not merely the mechanical difficulties of endeavoring to obtain reports from collectors all over the eastern United States have led me to confine this expression of opinion to collectors from the Philadelphia region, but the fact that this area lies midway in the eastern range accorded the species would seem to offer a fair mean of conditions. As a suggestion of the probable verity of this, of the three collectors reporting the plant in the Connecticut Catalogue, Dr. Eames writes me: "In regard to *D. Ajacis* being really naturalized in any case would say that it persisted for many years about a garden in Bridgeport. In one other instance it appeared to be thoroughly naturalized along a roadside, upon ledges in thin, rather dry soil, and in an adjoining field in Weston, Connecticut, when seen some years ago — a station, however, but little more than a stone's throw from an old house, although in land not under cultivation in recent years,

[1] Mr. Leibelsperger, in correspondence, speaks of this, *or another species*, occurring in grainfields in his vicinity. It is rather confidently expected that this will prove to be *D. Consolida*, but specimen evidence is unfortunately not available at this writing.

or in large part a natural sterile waste"; while Mr. Bissell says boldly that he does not know it as a good escape or persisting; and Mr. Harger characterizes it as "a fugitive garden escape" which he has seen only by roadsides. It would seem probable that the same general opinion obtains in Connecticut as in the Philadelphia area. From the Eastern Shore of Maryland — to turn in the opposite direction — Rev. J. P. Otis, while noting that a *Delphinium* has for several seasons been apparently taking care of itself in a door yard and the adjoining truck-patch in the village of Sharptown, writes that his observations are in agreement with those of the Philadelphia botanists. May there be added this last evidence — which almost exactly voices my own — that of Mr. W. W. Eggleston: "My own personal experience with *D. Ajacis* in the field is very limited, never having collected it more than two or three times. It has always been as a chance seedling."

If an opinion from the Philadelphia area may be taken as typical for the eastern United States, it will be agreed that *D. Ajacis* must be recognized as one of the weaker elements of our flora. But whatever its actual status it is to be recognized among our notable garden escapes, though the fact of its thorough naturalization would seem to be still open to some question.

There are comparatively few statements in the more recent local floras, even when the two species are distinguished, which can be taken at their full value in searching for information on the frequence of *D. Ajacis*. The statement in *The Plant Life of Maryland* that *D. Ajacis* is "infrequent" appears hopeful till it is balanced with *D. Consolida* occurring "Throughout the state .... common." There are so many general statements of state-wide frequence in this volume that one cannot but suspect that tradition is in large measure responsible rather than accurate observations. It is of interest to note that in the *Catalogue of the Flowering Plants and Ferns of Connecticut*, where statements on distribution are commonly found so credible, the species is reported as "Rare. Escaped from gardens into waste land and fields," only four stations being noted, and it is said to be "Adventive from Europe" rather than credited with the usual phrase, "Naturalized from Europe." Mr. Norman Taylor's statement in his *Flora of the Vicinity of New York* (which includes most of the Philadelphia area) — "An escape from cultivation throughout the range"— is rather noncommittal as to the extent of naturalization shown by the species, but it is to be strongly recommended as being less open to criticism than the average opinion found in manuals and floras.

Delphinium Consolida — to return to this species — is well known in Europe as a weed in grain fields. Bentham [1] succinctly describes it as "A common weed of cultivation" and definitely speaks of it appearing in corn fields in certain parts of England. It is of interest that the source of *D. Consolida* at New Egypt was, as Mr. Grove observes, apparently not gardens but seed in grain.[2] It was particularly gratifying to find that Mr. Harger's *D. consolida* was from "newly-seeded grass-land." He says that it occurred to him at the time that it was introduced with grass seed, although, on consideration, the size of the seed might lead one to doubt this. So many seeds, of varying sizes, are so well known as occurring in bad grass seed that I think it may be safely asserted that the mode of introduction of the Middlebury *D. Consolida* was quite similar to that at New Egypt.

I have been able to find practically no complete and satisfactory evidence of *D. Ajacis* occurring in grain- or grass-fields. Moreover, I am under the impression that the annual Larkspur commonly seen in gardens is *D. Ajacis*, rarely, if ever, the generally fewer-, smaller-flowered *D. Consolida*. If this is correct, there is a possibility that the source of *D. Consolida* may be very different from that of its near ally, and it may prove to be a field weed here in America as in other countries, rather than a garden escape, as has been suggested by Taylor in the *Flora of the Vicinity of New York*. Further evidence is to be desired at any rate that *D. Ajacis* is to be found as a weed of grain- or grass-fields.[3] The Philadelphia testimony points to this reputed occurrence as being traditional rather than actual. No doubt this has been in some measure due to the statement in European botanies concerning *D. Consolida*.

Though the present noted occurrence of *D. Consolida* may not be considered by some as sufficient evidence for the inclusion again of this species in our flora, it is at least suggestive that here is an opportunity for further field observations before the species is finally dis-

[1] Bentham, Handbook of the British Flora, 22 (1865).

[2] In this connection it is to be noted that as early as 1814 Pursh (Fl. Am. Sept. ii. 372) regards *D. Consolida* as "probably introduced with the seed of grain from Europe." It would seem impossible to decide, however, whether he really had the true *D. Consolida* here in America, or was merely lead to this opinion by a knowledge of the occurrence and habitat of the species in Europe.

[3] Darlington, in the Third Edition of the classical *Flora Cestrica*, under "*Delphinium Consolida*," makes these interesting observations: "This introduced plant is usually to be met with in gardens; and occasionally finds its way into the grain fields of thoughtless people who are in the practice of carrying garden-rubbish into the barn-yard. In such cases it threatens to become a nuisance."

credited to our area. I do not doubt but that many of the rarer introductions holding places in our manuals rest upon as little, or even less, conclusive evidence than that given by *Delphinium Consolida*. One need look no further than among the near allies to find some pertinent cases — for example, *Adonis autumnalis* and *Nigella Damascena*. *Eranthis hyemalis*, for long years holding a traditional but undisputed place in our American flora because naturalized at Bartram's Garden, Philadelphia and in Painters' Arboretum, near Media, Pennsylvania, is distinctly not above suspicion.

It is to be hoped that those who may feel that *D. Consolida* has not been shown eligible to a place in our manuals will also feel constrained to bring critical attention to bear upon the status of *D. Ajacis*.

Academy of Natural Sciences of Philadelphia.

SOME NOTES ON SPARTINA.

M. L. Fernald.

In checking the species of *Spartina* in northeastern America the writer has been surprised to note the recent treatments in the manuals of eastern North America of the coarse smooth salt marsh species. Hitchcock, in the 7th edition of Gray's Manual, following Merrill,[1] treats it as *S. glabra* Muhl., with vars. *pilosa* Merrill and *alterniflora* (Loisel.) Merrill; while Nash, in the 2d edition of Britton & Brown's Illustrated Flora, treats it as *S. stricta* (Ait.) Roth. In the 1st edition of Britton & Brown, Nash, following Gray,[2] had treated the American plants as *S. stricta* with two varieties, though he had added the luminous note, "Our plant does not appear to be satisfactorily identified with the European,"[3]; but in the 2d edition, the varieties have been omitted and with them the clarifying note, and all the American plants reduced outright to the European *S. stricta*. Examination of the European plant, however, shows *S. stricta* to differ from all the material from eastern America not only in the very pilose lemmas emphasized

[1] Merrill, U. S. Dept. Agric. Bur. Pl. Ind. Bull. no. 9, 8 (1902).
[2] Gray, Man. ed. 2, 552 (1856).
[3] Nash in Britton & Brown, Ill. Fl. i. 177 (1896).

by Merrill [1] in keeping the species apart, but in many other characters, which, in view of the recent tendency to reunite the eastern American plants with the European *S. stricta*, it is well to enumerate.

European *S. stricta* has the very short involute leaf-blades distinctly articulated to the firm sheaths, but "they are so readily detached from the sheaths, that by the time the plant is in flower most of the lower sheaths have lost their laminae." [2] This character is very conspicuous in herbarium-specimens of true *S. stricta* of Europe, in which half the blades have sometimes disarticulated; but in the American plant the long leaf-blade and soft sheath are continuous. The ligule of the European *S. stricta* is laciniate,[3] of the American a ring of hairs. And the European *S. stricta* is said by Syme to have the "Stem. . . . easily broken," terms which would not be used to describe the American plant by anyone who has vainly attempted to pull specimens from the marsh. In our plant the rhachis is ordinarily prolonged beyond the spikelets; in *S. stricta* the rhachis, though a little prolonged, rarely exceeds the spikelets. In short, *S. stricta* of Europe is quite unlike its American representative in many definite characters.

The plant of the northern Atlantic coast, from Newfoundland and the lower St. Lawrence to New Jersey, *S. alterniflora* Loisel., is, however, apparently inseparable from the authentic European material of *S. alterniflora*. This was recognized by Gray as early as 1856 and the identity has been admitted by many subsequent American and European students. It is unfortunate, therefore, since *S. alterniflora* Loisel. was published in 1807 and *S. glabra* Muhl. not until 1817, that the later name, *S. glabra*, should have been recently maintained for the species, and with a var. *alterniflora* based upon the earlier-published *S. alterniflora*. The latter name, obviously, has precedence as a specific name and the plants of the North Atlantic coast should be called:

Spartina alterniflora Loisel. Fl. Gall. ii. 719 (1807). *S. stricta*, var. *alterniflora* Gray, Man. ed. 2, 552 (1856). *S. glabra alterniflora* Merrill, U. S. Dept. Agric. Bur. Pl. Ind. Bull. no. 9, 9 (1902); Hitchcock in Gray, Man. ed. 7, 143 (1908).

S. alterniflora, var. **glabra** (Muhl.), n. comb. *Dactylis maritima* Walt. Fl. Carol. 77 (1788), not Curtis (1787). *S. glabra* Muhl. Gram. 54 (1817); Merrill, l. c. 8 (1902); Hitchcock, l. c. (1908). *S. stricta*,

[1] Merrill, l. c. 9.
[2] Syme, Engl. Bot. xi. 5 (1873).
[3] Rouy, Fl. Fr. xiv. 26 (1913).

var. *glabra* Gray, Man. ed. 2, 552 (1856). *S. stricta maritima* Scribn. Mem. Torr. Bot. Cl. v. 45 (1894).

S. ALTERNIFLORA, var. **pilosa** (Merrill), n. comb. *S. glabra pilosa* Merrill, l. c. 9 (1902); Hitchcock, l. c. (1908).

The name *Dactylis maritima* Curtis, Enum. Brit. Gr. (1787) seems to have received less attention than it merits. Linnaeus's *D. cynosuroides* (1753) [1] was to some extent a complex; consisting for the most part of the strictly American species now generally known as *Spartina cynosuroides* (L.) Roth, but with the habitat "Lusitania" appended to "Virginia, Canada," thus indicating that Linnaeus confused with the American plants one of the European species. Slightly later (1758), Loefling, in his *Iter Hispanicum*, published, without mention of the Linnaean species, a very detailed description of another *Dactylis cynosuroides* [2] which from the description ("*Vaginae* . . . imbricatae post folia decidua per inferiorem culmum," etc.) is unquestionably the *D. stricta* Ait. Hort. Kew. i. 104 (1789), afterward renamed *Spartina stricta* (Ait.) Roth (1802). Some post-Linnaean English botanists took up Loefling's *Dactylis cynosuroides* for the Sea Cock's-Foot Grass of Europe; for instance, Hudson in his *Flora Anglica*.[3] And when Aiton's *D. stricta* was published in 1789, it was as a substitute for the *D. cynosuroides* of Loefling and of Hudson, which is clearly indicated by his citation of those authors alone, not of Linnaeus. But a very similar publication, with equally definite citations, was earlier effected by Curtis in 1787, when he published his *Dactylis maritima*. Curtis's publication, under *Dactylis*, was in the briefest possible form: "2. Maritima. *H.* 43. *Cynosuroides. R.* 393. 4 Sea." [4] But by inserting the expanded bibliographic citations, as indicated by Curtis's explanation, it becomes:

2. Maritima. Hudson, Fl. Angl. ed. 2, 43, as *D. Cynosuroides* (1778) Ray, Synop. ed. 3, 393, no. 4 (1724) Sea Cock's-Foot Grass.

Dactylis cynosuroides Huds., not L., was the *D. cynosuroides* of Loefling, and is clearly the *D. stricta* of Ait. as indicated not only by

[1] L. Sp. Pl. i. 71 (1753).

[2] Loefl. It. Hisp. 115 (1758).

[3] Huds. Fl. Angl. 25 (1762), ed. 2. 43 (1778).

[4] Curtis, Enum. Brit. Gr. (1787). The writer has not seen the original issue of Curtis's *Enumeration*, which is said to have been a 1-page folio published in 1787. Through the kindness of Miss Marjorie L. Warner of the United States Department of Agriculture, he has learned, however, that in Volume 1 of the *Flora Londinensis* at the Library of Congress, there occurs a 4-page leaflet: "General observations on the advantages which may result from the introduction of the seeds of our best grasses," the 4th page of which is the "Enumeration of the British Grasses," dated at the end: "Botanic-garden, Lambeth-Marsh, August 7, 1787."

Loefling's splendid description but by Aiton's citation. The other component of *D. maritima* Curtis was Ray's no. 4 on p. 393. This was the *Spartum Essexianum, spica gemina clausa* of Petiver's *Graminum Concordium* (1712?), which had been taken up by Ray under the same name, with the citation of various specimens collected by Buddle and others, who were cited by Hudson (ed. 1) under his *D. cynosuroides*. *Spartum essexianum* is placed without hesitation by British authors (Smith,[1] Gibson,[2] *et al*) in the synonymy of *Dactylis stricta* Ait. or *Spartina stricta* (Ait.) Roth. There seems no question, then, that the common European species which is generally known as *S. stricta* should be called

Spartina **maritima** (Curtis), n. comb. *Dactylis cynosuroides* Loefl. It. Hisp. 115 (1758); Huds. Fl. Angl. 25 (1762), ed. 2, 43 (1778); not L. *D. maritima* Curtis, Enum. Brit. Gr. (1787). *D. stricta* Ait. Hort. Kew. i. 104 (1789). *Spartina stricta* (Ait.) Roth, Neue Beitr. 101 (1802).

In view of the identity of the American and European *Spartina alterniflora*, it may be worth while to note that among the European specimens in the Gray Herbarium received as *S. stricta* is one from Aquilega, at the head of the Adriatic Sea, which is certainly typical *S. Michauxiana* Hitchcock.

It is also noteworthy that *S. Duriaei* Parl. Fl. Ital. i. 230 (1848) or *S. versicolor* Fabre, Ann. Sci. Nat. sér. 3, xiii. 123 (1850) of maritime sands of Europe is scarcely separable from *S. patens*, var. *juncea* (Michx.) Hitchc. The European specimens can be closely matched by American; and Durieu himself, who, it may be assumed, would be inclined to maintain *S. Duriaei* if he thought it a good species, treated it without reservation as identical with *S. juncea* (Michx.) Willd.—See Cosson & Durieu, Expl. Sc. Alg. ii. 88 (1849). Ascherson & Graebner (Syn. ii. 84), although maintaining *S. Duriaei*, speak of the "jedenfalls sehr nahe stehenden *S. juncea*."

Gray Herbarium.

[1] Engl. Bot. vi. t. 380 (1797).
[2] Gibson, Fl. Essex. 359, 360 (1862).

SOME WESTERN SPECIES OF PUCCINELLIA.

C. A. Weatherby.

In the course of a recent revision of the northeastern species of *Puccinellia*, undertaken by Prof. Fernald and the writer,[1] considerable comparison with western material was necessary. Incidentally, this comparison showed that the western plants which have been passing as *P. airoides* comprise, besides true *P. airoides*, two other species, rather readily distinguishable from it and from each other. One of these, *P. lucida*, occurs also about the Gulf of St. Lawrence and was included in the revision above-mentioned. A second, apparently undescribed, is so clearly separable that it seems worth recording, though it is entirely western in its range and therefore outside our special field; and it is here proposed as *P. Cusickii*. Two sheets in the Gray Herbarium, one collected at Anderson Valley, Oregon, June 24, 1896, *Leiberg*, no. 2388, the other at Wilson's Station in the Warner Mts. of northeastern California, *Griffiths & Hunter*, no. 390, the latter referred by Hitchcock to *P. airoides* (*P. Nuttalliana*),[2] may represent still another undescribed species. All the plants mentioned are characterized by erose-serrulate lemmas, pubescent below and narrowed above to an acute or blunt apex, not truncate-obtuse as in the group of *P. distans*.

A synopsis of the three species here considered follows. All the specimens cited are in the Gray Herbarium, with the single exception of the specimen of *P. lucida* from British Columbia, which is in the Herbarium of the Geological Survey of Canada.

* *Anther 0.5–1 (rarely 1.2) mm. long.*

+ *Lemma 1.5–2 mm. long, not lustrous; panicle-branches ascending or spreading.*

P. AIROIDES (Nutt.) Wats. & Coult. in Gray, Man. ed. 6,668 (1890).[3]
— Yukon and Mackenzie to Montana, Nebraska and New Mexico.

Representative specimens examined:— MONTANA: Dillon, July 3, 1895, *Shear*, no. 331. WYOMING: open, wet, stony meadows, Centennial, Albany Co., July 26, 1900, *A. Nelson*, no. 7700. COLORADO: Doyle's, July 29, 1901, *C. F. Baker*, no. 637; Walsenburg, Huerfano

[1] See RHODORA xviii, 1.
[2] In Jepson, Fl. Cal. pt. 3, 162 (1912).
[3] For full description and synonymy see RHODORA xviii, 16.

Co., July 10, 1896, *Clements*, no. 51. "Rocky Mts." (Powell Expedition), 1868, *Vasey*, no. 615.

+ + *Lemma 3–4 mm. long, thin and lustrous; panicle-branches often deflexed in age.*

P. lucida Fernald & Weatherby. Rhodora xviii, 16 (1916). Shores of the Gulf of St. Lawrence; Wyoming; British Columbia. Western specimens examined:— Wyoming: damp soil, Washington Ranch, June 29, 1901, *Merrill & Wilcox*, no. 63; in the margins of ponds, Mammoth Hot Springs, July 30, 1899, *A. & E. Nelson*, no. 6017 (this number, as represented in the Gray Herbarium, is partly *P. lucida*, partly *P. airoides*). British Columbia: salt marshes, Newcastle Island, Departure Bay, July 10, 1908, *J. Macoun*, herb. Geol. Surv. Can. no. 81,001.

* * *Anther 1.5–1.8 mm. long; lemma 2.5–3 mm. long; panicle-branches ascending or spreading, lax and flexuous.*

P. **Cusickii**, n. sp. Caespitosa perennis, 3.5–10 dm. alta viridis; culmis glabris laevibusque; foliorum caulinorum laminis 3–14.5 cm. longis 1–2 mm. latis exsiccatis plus minusve involutis subtus laevibus supra minute scabris valde nervatis, marginibus scabriusculis; ligula 1.5–2.5 mm. longa; panicula 0.4–3.5 dm. longa, plerumque exserta, rachi scabra, ramis filiformibus 2–5-verticillatis scabris adscendentibus vel patentibus laxis subflexuosis imprimis supra mediam partem floriferis, infimis usque ad 13 cm. longis; pedicellis scabris; spiculis 5–9 mm. longis laxe 3–6-floris saepe purpurascentibus, rachilla glabra inter flores in anthesi evidente; glumis tenuibus supra hyalinis minute eroso-serrulatis, inferiore 1–1.5 mm. longa anguste ovata ad apicem acutum angustata obscure 1-nervata, superiore 2–2.5 mm. longa ovata acuta obscure 3-nervata; lemmatibus 2.5–3 mm. longis late ovatis ad apicem acutum vel subacutum plus minusve abrupte angustatis infra subcoriaceis supra hyalinis et eroso-serrulatis basin versus pubescentibus obscure 5-nervatis; paleis lemmata aequantibus lanceolatis ad apicem fimbriato-emarginatum paullum angustatis, nervis supra scabris infra ciliatis; antheris (exsiccatis) 1.5–1.8 mm. longis purpureis; caryopsi immatura 1.6 mm. longa.

Cespitose perennial, green: culms 3.5–10 dm. high, rather slender, little if at all geniculate, smooth and glabrous: cauline leaves 3–14.5 cm. long, 1–2 mm. wide, in dried specimens more or less involute, smooth beneath, the margins and the prominently nerved upper surface minutely scabrous; ligule hyaline, 1.5–2.5 mm. long: panicle usually exserted, in small specimens short (down to 4 cm.) and narrow, in well-developed plants diffuse, ovoid-pyramidal, up to 3.5 dm. long; the rachis and branches scabrous, the latter 2–5 together, capillary, ascending or spreading, lax and somewhat flexuous, floriferous chiefly above the middle, the lowest up to 13 cm. long: spikelets often purple-tinged, 5–9 mm. long, loosely 3–6-flowered, the glabrous rachilla visible between the lemmas at anthesis: glumes thin, hyaline and

minutely erose-serrulate above; the first 1–1.5 mm. long, obscurely 1-nerved, rather narrowly ovate, tapering to an acute tip; the second 2–2.5 mm. long, obscurely 3-nerved, ovate, acute, the mid-nerve often minutely scabrous above: lemmas 2.5–3 mm. long, broadly ovate, rather abruptly narrowed to an acute or acutish tip, firm in texture below, hyaline and erose-serrulate above, pubescent toward the base, obscurely 5-nerved: palea about equalling the lemma, lanceolate, slightly narrowed to the fimbriate-emarginate tip, scabrous on the nerves above, ciliate below: anthers in dried specimens 1.5–1.8 mm. long (somewhat longer when boiled out and perhaps in fresh material), purple: immature grain 1.6 mm. long.— "Saskatchewan" and Assiniboia to Wyoming and eastern Oregon. "SASKATCHEWAN": *Bourgeau*, 1858. ASSINIBOIA: salt marshes, Cypress Hills, July 31, 1880, *John Macoun*. WYOMING: Little Laramie River, 1897, *T. A. Williams*, no. 2291. OREGON: in alkaline alfalfa meadows, Grande Ronde Valley, 930 m. alt., June 30, 1908, *Cusick*, nos. 3269 and 3271 (the latter TYPE in Gray Herb.)

In the character of its inflorescence and in its large anther resembling *P. Lemmoni*, but lacking the dense basal tufts of involute-setaceous leaves which seem to be characteristic of that species and differing further in its pubescent lemma and glabrous rachilla. In *P. Lemmoni* the lemma is glabrous, but the callus pubescent and the rachilla of the spikelets is more or less pubescent or scabrous.

EAST HARTFORD, CONNECTICUT.

VARIANTS OF ASTER HERVEYI.

E. WILLIAMS HERVEY.

IN examining a number of specimens of *Aster Herveyi*, the writer discovered some forms differing from the described type especially in the size and shape of the leaves, which varied from broadly ovate, acute at tip, and rounded or slightly heart-shape at base to ovate-lanceolate or lanceolate; some even tapering at base into a more or less margined petiole. The broader leaf-form resembles *Aster macrophyllus* and is found most abundant in its neighborhood. The narrower leaf-form is found in dryer soil where *Aster spectabilis* is more common. These two forms often are so similar to the above species as to be scarcely distinguishable. *A. macrophyllus* and *A. spectabilis* are usually found in the vicinity of *A. Herveyi*. The same root of *A.*

Herveyi has been seen to bear root-leaves of the two extreme forms mentioned. From the foregoing facts as well as others it is manifest that *A. Herveyi* is a hybrid.

Unlike other Aster hybrids, however, which are rarely found except singly or two or three together *A. Herveyi* has been found in colonies of a rod or two in extent and then beyond scattering over several acres of an open woodland. This hybrid may be propagated at least in part by seed as shown from the following: Next to a garden containing a bed of transplanted *A. Herveyi* there was a vacant grass-grown lot. In course of time the lot was ploughed and planted and in a year or two after several specimens of *A. Herveyi* were found growing and in bloom on one side where the soil had been disturbed. These must have originated from self-sown seed from the garden as none existed there before.

New Bedford, Massachusetts.

Autumn Excursion of the New England Botanical Club.—It was the unanimous desire of the twelve men who braved the rainy weather of June 10 and 11 on Cape Cod this year, that there should be a similar or larger excursion to Hyannis in September. Accommodations are available at the Hyannis Inn at $2.50 per day. Fare from Boston is $1.92 each way. The Committee has set Sept. 15–17 for this excursion. It is hoped that everyone will be back from vacations at this time and ready for one more good trip before the season closes.

The June excursion brought several additions to the flora of Cape Cod, and a few to that of New England. Southeastern Massachusetts has furnished a larger number of plants new to our flora during the past eight years than any other section of New England. The area is large, and the workers have been few. May this excursion prove to be the largest and most successful in the history of the Club.—Clarence H. Knowlton, Chairman of Excursion Committee.

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THE OLD STUMPS AT BLANC SABLON.[1]

Charles W. Townsend, M.D.

Professor M. L. Fernald, who, in 1910, made at this point [Blanc Sablon] a brief incursion into Labrador has most interestingly described the region in the pages of Rhodora.[2] "Here" he says "was an ideal place to study the vegetation of a highly calcareous region side by side with the plants of a silicious and gneissoid area, and if anyone doubts the dissimilarities of these floras he can find no better spot in which to undeceive himself than at Blanc Sablon."

Like him I was struck by the flat grassy plains on the tops of the terraces, so different from the rounded and irregular surfaces of the granitic rocks with their wealth of mosses and lichens and their comparative paucity of grasses. Prof. Fernald says "The *commonest flower* of the Laurentian plains is *Carex rariflora*, though with singular regard for its specific name it is by all means the rarest of its genus in New England." But the most surprising feature which is described and figured by Prof. Fernald is the presence of stumps of forest trees, and with them a forest vegetation still lingering in the plains now fully exposed to the sun. Dwarf cornell, snow berry, Linnaea, star flower, clintonia, one-flowered pyrola and dwarf solomon seal were most in evidence, and Professor Fernald mentions also such typical forest species as red baneberry, Dewey's sedge, great-spurred violet, miterwort and sweet-scented bedstraw.

I measured several of the stumps that were a foot or two high with

[1] Read by invitation at a meeting of the New England Botanical Club, May 5, 1916. Extract from Chapter XII of "In Audubon's Labrador."

[2] "A Botanical Expedition to Newfoundland and Southern Labrador." M. L. Fernald, Rhodora, xiii, 109–162 (1911).

great sprawling roots, now destitute of bark and blanched by the sun and storm, but yet fully a foot in diameter or three feet in circumference. Sometimes a prostrate trunk three or four feet long would be seen. One pictures an ancient forest, very different from the grassy plains with occasional clumps of dwarfed and stunted spruces and fir bushes that are here now.

Professor Fernald was much interested in these stumps. He says: "In such accounts as I have found (except possibly Cartier's) the coasts of the Straits of Belle Isle are described as desolate and bare, and even Cartier, in 1534, entering the Straits and anchoring at Blanc Sablon, was so impressed with the barrenness that he wrote: 'If the land was as good as the harbors there are, it would be an advantage; but it should not be named the New Land but [a land of] stones and rocks frightful and ill shaped, for in all the said north coast I did not see a cart-load of earth, though I landed in many places. Except at Blanc Sablon there is nothing but moss and small stunted woods; in short I deem rather than otherwise, that it is the land that God gave to Cain;'[1] and again on his second voyage in 1535, he wrote: 'The whole of the said coast from the Castles as far as here [note, by Prof. Fernald, "From Chateau Bay as far as Brest, west of Blanc Sablon"] bears east-northeast and west-southwest, ranged with numerous islands and lands all hacked and stony, without any soil or woods, save in some valleys'.[2] And at the present time the people at Blanc Sablon insist that there has never been any forest there and that no timber exists within four or five miles of the Straits. Yet, the first day I saw upon the terraces east of Blanc Sablon such plants as have just been enumerated I was convinced that a forest must have been there, since these are so distinctly woodland species and so decidedly not plants typical of the Arctic barrens and tundra. So my delight can be imagined when, crossing with Kidder the tableland east of Blanc Sablon, we came upon buried logs in the bog and soon after found numerous stumps protruding from the moss. Some of the stumps, now much crumbled, were still a foot or more in diameter and indicated an ancient forest of considerable size. Just when this forest lived it is difficult to say, but if it still throve in the 16th century Cartier did not give a very clear indication of it. Only by such indefinite expressions as 'except at Blanc Sablon there is nothing but moss and stunted woods' and 'without any soil or woods, save in the

[1] J. P. Baxter, Memoir of Jacques Cartier, 86 (1906).
[2] J. P. Baxter, l. c. 130.

valleys' did he indicate a possible forest covering. But here at least was a remnant of the forest which had once sheltered *Carex Deweyana, Actaea rubra* and *Viola Selkirkii,* though at the present time only shrubs or dwarf straggling trees, as described by Cartier, thrive on the bleak and wind-swept shores of the Straits of Belle Isle; and that the forest was an extensive one and presumably once fringed the entire length of the Straits we are safe in assuming from the presence at Bonne Espérance L'Anse au Clair, Forteau, Red Bay, and Chateau (as shown by the collections of John A. Allen and others) of a relic forest vegetation (sometimes further augmented by *Onoclea sensibilis, Osmorhiza obtusa, Pyrola secunda,* etc.) such as abounds on the terraces of Blanc Sablon."

The name of the island near at hand "Isle au Bois" hints at the former presence of a forest, yet if forests existed in Cartier's time we should expect a different account from him. Our knowledge of the history of the Labrador Peninsula since the glaciers melted a few thousand years ago would negative the possibility of a climate or topography that could support a forest such as these stumps and woodland plants suggest. Moreover the stumps themselves can hardly date back to Cartier who found "the land that God gave to Cain."

How can we explain the seeming paradox? Like many things in nature, the explanation, which I chanced upon in a walk over the plains to Anse Éclair, is very simple. The answer is there has been no change; here are forest conditions at the present day, and here are plenty of forest trees right before our eyes. Where the ancient white stumps are so prominent the forest has been cut away as is apt to be the case near settlements, but farther away to the east and west along the coast there are regions where forest conditions of darkness, dampness and quiet reign as truly as in the forest aisles where the trees rear their heads to the skies and wave and sough in the winds. The forest vegetation is the same in both cases.

One is at first disposed to deny these statements and say there are no trees here, merely spruce and fir bushes, insignificant things with flat tops clipped as it were by the arctic blasts, but a close examination reveals the forest conditions. This examination is extremely difficult unless one is provided with an axe, or, better still finds a place where wood cutting has recently taken place, and the actual habits of the wood-cutter can be learned. This gives the key to the situation and at once explains the existence of the ancient stumps.

From a study of a number of partial clearings in various places about Blanc Sablon I found that the wood-cutter often chooses a spruce or fir bush with a large central trunk, first cuts off the branches, and then the whole top of the trunk, leaving a stump exactly like the stump figured by Professor Fernald which so irresistably compels in us the conception of a lofty tree, a conception, which, to a botanist, is rendered still more compelling by the presence, in the neighborhood of the stumps, of a type of vegetation found only in forests. I regret that a photograph I took of one of these trees that had been partly cleared of branches proved to be one of the mysterious failures which happen at times to all except super-human photographers, but I am able to give the dimensions of this tree, which, it seems to me, thoroughly sustains my contention. The tree was a black spruce with a trunk forty-seven inches in circumference one foot from the ground. Its diameter was therefore about one foot, two and a half inches. This size of the trunk was maintained nearly to the highest branch which went off at right angles thirty-two inches from the ground. From the center to the tip of the branches on all sides was nine feet making a diameter for the whole tree of eighteen feet. It is true that many of the clumps of evergreen bushes are made up of a number of small trunks, but it is also true as I found that trunks of the size just described were not uncommon. In places the trunks are four or even five feet high.

When the trees are continuous over a considerable area they form an almost impassible barrier. Many times, beguiled by a favorable opening, I determined to disregard the difficulties and pass through a hundred yards or so to an open land beyond when I found my progress so barred after a hard struggle of a few yards, that it seemed an economy of both time and effort to go even a mile around, rather than to attempt the straight and extremely narrow course. Where the trees are only a foot or two high, one can walk on their tops, but this is out of the question in trees four or five feet high. Perhaps one could have managed it with modified snow shoes.

To delve beneath these ancient trees, — for my former studies of tree rings in various places on the Labrador Coast assures me that many of these trees must be much over a hundred years old and may in some cases date back even to Cartier — is a difficult task, but one finds here a habitat in which forest plants are surely at home.

BOSTON, MASSACHUSETTS.

TWO ASIATIC ALLIES OF RANUNCULUS PENSYLVANICUS.

S. S. Chien.

Specimens of two species in the Gray Herbarium, collected in China and Hongkong, are under the name of *Ranunculus pensylvanicus* L. One of these plants from Hongkong and Shanghai is erect and more or less like the American species, except in its fruit character. The other plant, one sheet of which is from Fokien and another from Hupeh, has its fruit similar to the American plant, although with strongly hooked style, but has a repent habit. Both of these species have been considered identical with the American plant. Since they differ, however, from the American species in such important characters, it seems desirable to describe them under new names.

Ranunculus **brachyrhynchus**, n. sp., caule erecto elato pilis late patentibus hirsuto; foliis inferioribus longe petiolatis, superioribus subsessilibus; foliolis petiolulatis inaequaliter 3-lobatis argute serratis; floribus parvis; sepalis reflexis subtus hirsutis supra glabris; achaeniis in capite globoso vel paullo lateque ovoideo symmetricis tam in margine dorsali quam ventrali aequaliter curvatis; stylo brevi recto basi lato ad apicem achaenii centroso, faciebus achaeniorum planis prominenter marginatis; receptaculo piloso.

Stem erect, tall, hirsute with widely spreading hairs; lower leaves long-petioled; upper subsessile, ternatifid; leaflets stalked, unequally 3-lobed, sharply serrate, acute: flowers small: sepals reflexed, hirsute on the lower side, glabrous on the upper; achenes in a globose or slightly broad-ovoid head, symmetrically curved on both the dorsal and ventral margins; style short, broad-based, straight, centrally placed; faces of the achene prominently margined; receptacle pilose.—Hongkong: April 17, 1893, *Hongkong Herbarium*, no. 10,200 (type in Gray Herb.). China: Shanghai, comm. *Wykeham Perry*, 1883.

This plant is distinguished from *R. pensylvanicus* L. by the symmetrical outline of the achene, the dorsal and ventral margins being about equal, by the prominent intramarginal ridge and the centrally placed beak. The American plant has its fruit with round dorsal edge and almost straight ventral edge, and it is obscurely margined. The head of achenes of the Chinese plant is essentially globose, while that of the American plant is elongated.

RANUNCULUS **arcuans**, n. sp., caule 10–17 cm. longo repente pilis late patentibus hirsuto; foliis radicalibus longius petiolatis quam caulinis, omnibus ternatifidis dense hirsutis in facie inferiore supra sparse pilosis; foliolis 3-lobatis; lobis grosse dentatis; floribus parvis; sepalis reflexis subtus hirsutis supra glabris; achaeniis in capite globoso prominenter marginatis margine dorsali rotundatis, margine ventrali vel minus rotundatis vel rectiusculis, faciebus planis, rostro in apicem arcuatam attenuato.

Stem 10–17 cm. long, repent, hirsute with bristling widely spreading hairs: radical leaves longer-petioled than the stem-leaves, all ternatified, densely hirsute on the lower side, sparingly pilose on the upper; leaflets 3-lobed, lobes coarsely toothed: flowers small: sepals reflexed, hirsute on the lower side, glabrous above: achenes in a globose head, prominently margined, dorsal margin rounded, ventral much less so or nearly straight; faces flat; beak attenuate into a hooked tip.— CHINA: Province of Hupeh, 1885–88, *A. Henry*, no. 4039 (type in Gray Herb.); Province of Fukien, 1904, *Hongkong Herbarium*, no. 2317.

This plant has a low and repent habit as contrasted with *R. pensylvanicus* L., which is high and erect. The achenes of these two species are more or less alike but the style in the Chinese plant is longer than in the American and conspicuously hooked. The achenes of the Chinese plant are also prominently margined and the shape of the head of achenes is globose.

SHANGHAI, CHINA.

GALIUM PILOSUM AND ITS VARIETIES.

C. A. WEATHERBY AND S. F. BLAKE.

EVER since 1841 the traditional treatment of *Galium pilosum* has been that adopted in Torrey and Gray's Flora of North America, distinguishing a typical, wide-spread variety with pubescent stem and commonly oval leaves, and a southern one nearly or quite glabrous and with narrower, more oblong leaves. The recent collection by one of us, on Cape Cod, of two apparently different forms has led to a study of the forms of the species which shows that at least one more variety can profitably be recognized, and also leads to what we may

hope to be the final retirement from our lists of the name *Galium bermudense* L. which has been associated with this and with two or three other species of *Galium* and *Relbunium* within recent years.

All the material of *Galium pilosum* in the Gray Herbarium and the Herbarium of the New England Botanical Club from north of a line running from western North Carolina and adjacent Kentucky to Arkansas and Texas has the stem more or less pubescent on the angles, usually densely so but sometimes only sparsely, with generally straightish pilose or pilose-hispid hairs, usually reaching up to or into the inflorescence, but sometimes confined to the lower portion of the plant. Occasionally some of the hairs are more or less recurved or, more rarely, inflexed. In the Cape Cod area, in the sand-plain regions of Connecticut and New Jersey and in the mountains of North Carolina occurs an extreme of this form having the sides of the stem as well as the angles more or less densely pubescent. At first it seemed that this plant might well be distinguished as a variety, but careful study of the available material has shown too great a proportion of specimens variously intermediate between the two extremes to make it desirable, in the present state of our knowledge, to attempt to separate them, although further field study may yet make this possible. The following specimens may be cited as representative of this more pubescent extreme: — NEW JERSEY: sand-hills, Atlantic City, July 14, 1870, *C. F. Parker*. NORTH CAROLINA: summit of Cedar Cliff Mt., alt. 3400 ft., July 16, 1898, *Biltmore Herb.* no. 3498b. To the less pubescent of these two forms belongs the Aiton type of *Galium pilosum* (New York, *Dr. Martin*) in the British Museum.

From Virginia to Florida and Texas there occur two very distinct varieties of *G. pilosum*, hitherto confused under the name var. *puncticulosum* (Michx.) T. & G. One of these has oval leaves as in the typical form of the species, pubescent with incurved, short, stiff hairs, and stem more or less densely beset on the angles with short, incurved, hook-like hairs distinctly harsher than the hairs of the typical form; the other, with more narrowly elliptic leaves and absolutely glabrous stem, might conceivably be regarded as specifically distinct but seems on the whole, from its identity in all other characters and from the presence of an occasional intermediate, better considered as worthy only of varietal rank. Dr. H. Lecomte and M. F. Gagnepain of the Paris Museum, to whom sketches and descriptions of these two forms were sent, have kindly examined the Michauxian type of

Galium puncticulosum and find it to be the former; for the latter, the varietal name *laevicaule* may appropriately be used.

The disposition of Linnaeus's *Galium bermudense* has always been a matter of dispute to botanists and a full identification of its elements has never previously been made. It was described thus: —

"GALIUM foliis quaternis linearibus obtusis, ramis ramosissimis. Aparine foliis quaternis obtusis laevibus. *Gron. virg.* 16. Rubia tetraphylla glabra, latiore folio, bermudensis, seminibus binis atropurpureis. *Pluk. alm.* 324. *t.* 248. *Raj. suppl.* 261.

Habitat in Virginia."[1]

The Gronovian name is based on *Clayton* 313 in the British Museum which is the less pubescent phase of the typical form of *Galium pilosum*, very similar to Aiton's type. Plukenet's plant, still preserved at the British Museum, is *Relbunium hypocarpium* (L.) Hemsl.[2] with which it has previously been identified by Mr. Britten, who takes up for it the name *Relbunium bermudense* (L.) Britten.[3] Ray's plant, which seems never to have been examined hitherto, is *Galium circaezans* Michx., collected in Maryland by Krieg or Vernon. As if this confusion were not enough, we find in Linnaeus's own description a character ("foliis . . . . linearibus") which could by no possibility apply to any of these three species. Nor is there any specimen named *G. bermudense* in the Linnaean herbarium. Finally, the specific name "bermudense" taken from Plukenet's polynomial is quite at variance with the habitat, Virginia, attributed to the species by Linnaeus.

When we come to examine the treatment of *Galium bermudense* by authors subsequent to Linnaeus, we find an absolute lack of uniformity. Walter copies the Linnaean description without comment. Michaux has it not, but describes as new *G. puncticulosum*,[4] quoting *G. purpureum* Walt. (nec L.) as synonymous and Clayton's 313 as doubtfully identical. Willdenow[5] altered the name to *G. bermudianum* without changing the description and, in the fashion of some modern botanists, added the "popular" name "Bermudisches Lab-

[1] Sp. Pl. i. 105 (1753).

[2] The species was named *Valantia hypocarpa* by Linnaeus in 1759 without reference to Plukenet's plant. Its chief synonyms are: — *Valantia hypocarpa* L. Pl. Jam. Pug. 30 (1759): *V. hypocarpia* L. Syst. ed. 10. ii. 1307 (1759): *Relbunium hypocarpium* Hemsl. Biol. Centr. Amer. Bot. ii. 63 (1881). As the species was first published as *Valantia hypocarpa*, its specific name under *Relbunium* should be written "*hypocarpum*."

[3] Journ. Bot. xlvii. 42 (1909).

[4] Fl. Bor.-Am. i. 80 (1803).

[5] Sp. Pl. i. pt. 2. 596 (1798).

kraut" for a species whose habitat is still given as Virginia. Pursh [1] retains the name but gives a description applicable only to *G. puncticulosum* Michx., which in fact he cites as a synonym, and has *G. pilosum* as a distinct species. Pursh's action consequently cannot be taken as determining the application of the name, since he associates it (in the form *bermudianum*) with a plant not an element of the original Linnaean species. With Torrey,[2] Elliott [3] and other early writers on American botany, *G. bermudense* or *G. bermudianum* was a species of considerable uncertainty. In the Prodromus [4] *G. bermudianum* Pursh was referred to *G. puncticulosum* Michx., of which *G. pilosum* was made a variety. In Torrey & Gray's Flora of North America [5] "*G. bermudense* Linn. *spec.* 1. p. 105, as to syn. *Gronov.*, but not of *Pluk. alm. t.* 248" was referred to *G. pilosum*, var. *puncticulosum*, and the statement was made that "the name of *G. Bermudense* should be retained for the 'Rubia tetraphylla glabra, latiore folio, Bermudensis' etc. of Plukenet." In the Synoptical Flora,[6] however, "*G. Bermudense*, L. Spec. i. 105, as to syn. Pluk." was referred to typical *G. pilosum* and "*G. Bermudense*, L. l. c. as to syn. Gronov." to its var. *puncticulosum*. In Britton & Brown's Illustrated Flora, ed. 1 [7] *G. bermudense* appears as a doubtful synonym of *G. pilosum*, but in the second edition [8] we find *G. bermudense* displacing *G. hispidulum* Michx. as the name for that relbunioid *Galium*.

To recapitulate: — *Galium bermudense* L. as originally published included *G. pilosum*, *G. circaezans*, and *Relbunium hypocarpum*, all of which would be excluded by its description, and its name was in contradiction with the habitat assigned it. It has since been identified, in whole or in part, with *Galium pilosum*, *G. puncticulosum*, *G. hispidulum*, and *Relbunium hypocarpum*. It seems to the writers that under the circumstances the name *Galium bermudense* L. had best be relegated forever to the limbo of *nomina confusa*.

The varieties of *Galium pilosum* will then stand as follows: —

* *Stem from densely pilose all over to sparsely spreading-pilose or spreading-hispid-pilose on the angles below.*

G. PILOSUM Ait. Hort. Kew i. 145 (1789); Willd. Sp. Pl. i. pt. 2. 599 (1798); Pursh, Fl. Am. Sept. i. 104 (1814); T. & G. Fl. N. Am. ii.

[1] **Fl. Am. Sept. i. 104 (1814).**
[2] **Fl. N. & Mid. U. S. i. 169 (1824).**
[3] **Sk. i. 196 (1816).**
[4] **iv. 601 (1830).**
[5] **ii. 24 (1841).**
[6] **i. pt. 2. 37 (1884).**
[7] **iii. 221 (1898).**
[8] **iii. 266 (1913).**

24 (1841) excl. syn. Walt.; Gray, Syn. Fl. i. pt. 2. 37 (1884) excl. syn. L. and Walt. *G. bermudense* L. Sp. Pl. i. 105 (1753), as to syn. Gronov. and habitat only. *G. bermudianum* Willd. Sp. Pl. i. pt. 2. 596 (1798), as to syn. Gronov. and habitat only. *G. puncticulosum*, β. *pilosum* DC. Prod. iv. 601 (1830). *G. rotundifolium* L. ϑ. *bermudense* Ktze. Rev. i. 282, 283 (1891), at least in part. *G. rotundifolium* ϑ. *bermudense* f. *pilosum* Ktze. l. c. 282.—Southern N. H. and southern Vt. to D.C. and in the mts. to N. C. and Ky., west to Ill., Kan., and Tex. Representative specimens examined:—VIRGINIA: along Peak Creek, Peak Mtn., alt. 2200 ft., July 16, 1892, *J. K. Small;* Fall Creek, alt. 585 ft., July, 1893, *A. A. Heller*, no. 1108 (this specimen matches *Clayton* 313 fairly well). WEST VIRGINIA: rocky hillside near Travellers' Repose, Sept. 19, 1904, *Greenman*, no. 310. KENTUCKY: Poor Fork P. O., Harlan Co., Aug., 1893, *T. H. Kearney, Jr.*, no. 233. TEXAS: between Bejar and el Rio de la Trinidad, May, 1828, *Berlandier*, no. 1578.

** *Stem merely finely incurved-uncinate on the angles or glabrous.*

Var. PUNCTICULOSUM (Michx.) T. & G. Stem finely and usually densely incurved-uncinate on the angles, at least below; leaves oval, 1–2.3 cm. long, 4–10 mm. wide, 2–2½ times as long as wide, their hairs incurved-uncinate like those of the stem.— Fl. N. Am. ii. 24 (1841) in part; Gray, Syn. Fl. i. pt. 2.37 (1884) in part. *G. purpureum* Walt. Fl. Car. 87 (1788), not L. *G. puncticulosum* Michx. Fl. Bor. Am. i. 80 (1803), excl. Clayt. no. 313. *G. punctatum* Pers. Syn. i. 128 (1805). —VIRGINIA: Bedford Co., Aug. 1871, *A. H. Curtiss.* GEORGIA: Bullock Co., dry pine barrens, June 26, 1901, *R. M. Harper*, no. 947. FLORIDA: Duval Co., roadside, June 10, 1902, *A. Fredholm*, no. 5290; Lake Co., high pine land near Eustis, July 1894, *G. V. Nash*, no. 1383; without definite locality, *Chapman.* MISSISSIPPI: Biloxi, July 1900, *S. M. Tracy* " = 4485." A specimen from dry woods, Athens, Ga., June 25, 1900, *R. M. Harper*, no. 38, is intermediate between this variety and the typical form.

Var. **laevicaule** n. var., caule omnino glabro; foliis anguste ellipticis 1.2–2.8 cm. longis 3–7 mm. latis, longitudine quam latitudine 2½–4-plo majore, sparse pilosis, pilis non valde incurvatis.

Stem glabrous throughout; leaves narrowly elliptic, 1.2–2.8 cm. long, 3–7 mm. wide, 2½–4 times as long as wide, sparsely pilose with hairs which are not strongly incurved.— Var. *puncticulosum* T. & G.

l. c. and subsequent authors, in part.— VIRGINIA: Norfolk, *Dana*. FLORIDA: low fertile ground near Jacksonville, June 18, 1898, *A. H. Curtiss*, no. 6420 (TYPE, in Gray Herb.); moist places, near Eustis, May, 1894, *G. V. Nash*, no. 838. TEXAS: ("floribus albis") Houston, June 1843, *Lindheimer*. A specimen from dry hillsides and woods, Alexandria, La., May 31, 1899, *C. R. Ball*, no. 514, is intermediate between this variety and the typical form.

THE REPRESENTATIVES OF TRISETUM SPICATUM IN EASTERN AMERICA.

M. L. FERNALD.

TRISETUM SPICATUM (L.) Richter, var. **pilosiglume**, n. var., culmis densissime tomentosis 1.5–5 dm. altis; foliis plus minusve pilosis, vaginibus tomentosis, pilis reflexis; paniculis plerumque argenteo-viridibus rare subviolaceis deinde albido-brunneis 2–7 cm. longis valde interruptis; spiculis 2–3-floris; glumis pilosis, inferiore lanceolato-attenuata 3.5–4 mm. longa, superiore ovato-lanceolata subaristata 3.5–4.7 mm. longa; lemmatibus 4.6–6.3 mm. longis lanceolatis apice laciniis setiformibus valde bipartitis; palea lemmate paullo breviori-bus apice laciniis setiformibus valde bipartita.

Culms densely tomentose, 1.5–5 dm. high: leaves more or less pilose: the sheaths tomentose with reflexed hairs: panicles mostly silvery-green, rarely somewhat violaceous, finally whitish-brown, 2–7 cm. long, obviously interrupted: spikelets 2–3-flowered: glumes pilose; the lower lance-attenuate, 3.5–4 mm. long; the upper ovate-lanceolate, subaristate, 3.5–4.7 mm. long: lemmas 4.6–6.3 mm. long, lanceolate, obviously 2-cleft at apex into setiform segments: palea a little shorter than the lemma, its apex 2-parted like the lemma.— Labrador and Newfoundland to northern New England and Ontario. LABRADOR: Rama, August 20–24, 1897, *J. D. Sornborger*, no. 240, in part; Okkak or Hebron, 1853, *Moravian Bros.*; Hopedale, August 4–6, 1897, *Sornborger*, no. 241; limestone and calcareous sandstone terraces, Blanc Sablon, August 1, 1910, *Fernald & Wiegand*, no. 2,569. NEWFOUNDLAND: island off Pike's Arm, July 19, 1911, *Fernald, Wiegand & Bartram*, no. 4,593 (TYPE in Gray Herb.); rocks, Black Island, July 20, 1911, *Fernald, Wiegand & Bartram*, no. 4,594; dry sea-cliffs, Tilt Cove, August 20, 1911, *Fernald, Wiegand & Darlington*, no. 2,568; dry limestone barrens, upper slopes and tablelands, alt. 200–300 m.,

Table Mountain, Port à Port Bay, August 16, 1910, *Fernald, Wiegand & Kittredge*, no. 2,571, July 16 & 17, 1914, *Fernald & St. John*, no. 10,780[a]. QUEBEC: damp calcareous rocks, Bradore, Saguenay Co., August 4, 1910, *Fernald & Wiegand*, no. 2,570; dry turf, Pointe à Peau, Brest, Saguenay Co., July 31, 1915, *St. John*, Herb. Geol. Surv. Can.; limestone detritus, near crest of Cap Barré, Percé, August 1, 1907, and cold northerly calcareous walls of Grande Coupe, Percé, August 5, 1907, *Fernald & Collins*, nos. 867, 868; on hornblende schist or in alluvium of an alpine brook, Allen's Ravine, north slope of Mt. Albert, July 26 & 28, 1906, *Fernald & Collins*, no. 401; crevices of limestone-conglomerate, north side of Cap Enragé, Bic, July 24, 1907, *Fernald & Collins*, no. 866. ONTARIO: exposed places, Red Rocks, Lake Superior, June 26, 1884, *J. Macoun*. MAINE: slide, west wall of North Basin, Mt. Katahdin, July 13, 1900, *Fernald*. NEW HAMPSHIRE: "in alpinis, cum *Oxyria*," White Mountains, *E. Tuckerman;* Mt. Washington, July 3, 1878 and July 29, 1887, *Faxon;* damp slopes, Alpine Garden, Mt. Washington, July 10, 1895 and August 7, 1896, *E. F. Williams*, August 19, 1907, *A. S. Pease*, no. 10,601; Bigelow Lawn, Mt. Washington, September 1, 1877, *Faxon;* Great Gulf, Mt. Washington, August, 1877, and September 1, 1877, *Faxon*, August 30, 1910, *A. S. Pease*, no. 12,884; on the "Fan," Huntington's Ravine, August 28, 1912, *A. S. Pease*, no. 13,897. VERMONT: Smuggler's Notch, July 5, 1897, *J. R. Churchill* (mixed with var. *molle*); "in rupestribus siccis umbrosis ad Colchester," *Wm. Oakes*.

In its pilose glumes unique in the maze of plants which pass undistinguished as *Trisetum spicatum*. In its comparatively small spikelets and interrupted inflorescence somewhat intermediate between the more arctic-alpine *T. spicatum*, var. *Maidenii* (Gandoger)[1] and *T. spicatum*, var. *molle* (Michx.) Piper.

True *Trisetum spicatum* of Europe, based upon *Aira spicata* L. Sp. Pl. i. 64 (1753), is apparently not found in northeastern America, though some Arctic and northwestern specimens may belong to it. The alpine plant of Europe, as shown by many specimens and descriptions as well as by such plates as those of Hallier,[2] Hartinger [3] or Correvon,[4] is a low plant (0.5–2 dm. high), with sheaths and leaf-blades either pubescent or glabrous; the inflorescence cylindric to obovoid, violet, bronze or brownish, very dense and spike-like, 1.5–3 cm. long,

[1] TRISETUM SPICATUM (L.) Richter, var. **Maidenii** (Gandoger), n. comb. *T. subspicatum*, f. *Maidenii* Gandoger, Bull. Soc. Bot. France, xlix. 182 (1902) *T. Maidenii* Gandoger, l. c. (1902).

[2] Hallier, Fl. von Deutschl. ed. 5, vii. t. 614 (1881).

[3] Hartinger & Della Torre, Atl. Alpenfl. iv. t. 428 (1884).

[4] Correvon, Atl. Fl. Alp. v. 471 (1901).

1–2 cm. thick (including the wide-spreading awns). In fact, the inflorescence is so very dense as to suggest, at first glance, that of *Phleum alpinum* or an *Alopecurus;* and it is noteworthy that an exceptionally discriminating New England botanist, long familiar in the field with the American var. *molle*, has placed in the Gray Herbarium a fine sheet of typical *T. spicatum* collected by himself on a mountain-summit of Salzburg, numbered and carefully labeled, but with no indication of even the generic name of the grass, which to his New England eyes seemed quite strange! In this typical *T. spicatum* the elliptic-lanceolate brown-edged smooth or merely scabrous-nerved glumes are acute or sometimes very slightly aristate, the upper 4–5 mm. long; the attenuate soft lemmas are 3–4 mm. long, slightly 2-cleft but scarcely aristate, and the palea is usually blunt and fimbriate at summit.

In Greenland and other regions of Arctic American and to some extent in northernmost Eurasia, the low plant with very dense inflorescence gives way to var. *Maidenii*, which is taller (1.5–3.5 dm. high) and with a looser interrupted inflorescence 2–6.5 cm. long, which has spikelets as in typical *T. spicatum* but with the glumes, lemmas and often the paleas more definitely aristate-tipped. This Arctic American representative of the species is apparently less common south of Greenland than var. *pilosiglume*, but it occurs on the Torngat Mts. of northeastern Labrador, and very locally south to the mountains of Newfoundland, and the Mingan Islands and the mountains of Gaspé County, Quebec.

In more temperate areas, of the Canadian and Transition regions, we get var. *molle* (Michx.) Piper,[1] which is based upon *Avena mollis* Michx,[2] a plant originally collected at Montreal. This plant in its typical development seems specifically distinct from *T. spicatum* of Europe, but through var. *Maidenii* and again through var. *pilosiglume* the series seems to merge and, until the complex which is passing in many regions as *T. spicatum* is more thoroughly studied, it is well to consider it an extreme variation. Var. *molle* is a tall slender plant, the culms 2–8 dm. high, bearing silvery-green, finally whitish-brown, much interrupted panicles 2.5–11 cm. long. Its spikelets are commonly larger than in our other varieties, the 2nd. glume 4.5–6.5 mm. long, and the glumes, the deeply 2-cleft lemmas and commonly the

[1] Piper, Contrib. U. S. Nat. Herb. xi. 125 (1906).
[2] Michx. Fl. Bor-Am. i. 72 (1803).

deeply 2-cleft attenuate paleas are obviously awn-tipped. This plant, which may deserve specific reinstatement, but which seems to pass directly into the other varieties, does not occur in the bleaker habitats nor the more northern regions, like the headlands of Newfoundland and the coast of Labrador, where the others are found. Geographically, it is decidedly more southern: known in Newfoundland only along the sheltered river-banks; and on the mainland extending from Rimouski Co., Quebec, westward across the continent, south very generally on ledgy shores or slopes through northern and western New England and north-central New York, and locally to the Carolina mountains.

Gray Herbarium.

ON THE MENDELIAN INTERPRETATION OF OENOTHERA CROSSES.

R. Ruggles Gates.

In a recent review of my book on Mutations,[1] East[2] takes occasion to repeat certain criticisms of the Oenothera work which have been reiterated in recent years with rather tiresome frequency. This criticism is to the effect that since it is known that in the Oenotheras a considerable percentage of the pollen grains, eggs and embryos frequently fail to develop, therefore it is impossible to draw any conclusions whatever from the abundant crossing experiments that have been made in this genus; unless, perchance the result happens (as it occasionally does) to be Mendelian. In the case of East, we are further assured that "no single fact discovered by those who have made pedigree cultures of the group, precludes a Mendelian interpretation." I venture to think that such a statement would only be made by one who had allowed his bias to outrun his discretion. It would further, I think, scarcely have been made if its author had first attempted to apply his idea to an explanation of the known facts.

[1] Gates, R. Ruggles, 1915. The Mutation Factor in Evolution, with particular reference to Oenothera. London: MacMillan. pp. xiv + 353, figs. 114.

[2] East, E. M. 1915. Rhodora **17**: 235–237.

As the matter is one of some importance, involving as it does the whole question of the interpretation of mutations in certain aspects, it may be worth while to point out some of the difficulties which East has failed to see. He will then have the opportunity of explaining them on a Mendelian basis.

It would be quite impossible in a limited space to discuss all the classes of cases which do not conform to the Mendelian conception, but a few of them, belonging to one class only, may be pointed out.

In the first place let us consider what de Vries calls mutation crosses, such as *Oe. Lamarckiana* × *rubrinervis* or its reciprocal. In such crosses the F_2 splits into the two parental types[1] and both breed true in later generations. We are assured by some that this can be explained as ordinary segregation, but for such an explanation the following assumptions must be made: (1) that *Lamarckiana* is heterozygous for the *rubrinervis* character, (2) that it breeds true both before and after the cross because the *rubrinervis* germ cells either fail to develop or fail to fertilize each other, (3) that about 50% of the *Lamarckiana* germ cells are *rubrinervis* in character, since *rubrinervis* usually appears with this frequency in crosses with *Lamarckiana*. Thus far the assumptions, though improbable are not impossible, and the fact that *Lamarckiana* may show 50% or more of sterility leaves the interpretation a loophole through which to crawl.

Now let us go a step further. If other flowers on the same *Lamarckiana* plant used to cross with *rubrinervis* are pollinated by *nanella* the dwarf mutant, the F_1 will again contain the parent forms *Lamarckiana* and *nanella* in widely fluctuating percentages, and the same result occurs in the reciprocal cross *Oe. nanella* × *Lamarckiana*. We must now apply the above Mendelian hypotheses *mutatis mutandis* to these crosses, and assume that some 50% or more of our *Lamarckiana* germ cells are now *nanella*. The same must be done for all the other forms which show a similar behavior in crosses with *Lamarckiana*. This is of course absurd, for it assumes that 50% of the *Lamarckiana* germ cells are at the same time *nanella*, *rubrinervis*, *oblonga*, etc. The only way out of this difficulty that I can see is by the further assumption that when one crosses *Lamarckiana* with *nanella* pollen all the *rubrinervis* germ cells present obligingly disintegrate and disappear,

[1] The form of *rubrinervis* derived from this cross has since been found to differ in certain particulars and has been called *subrobusta*. But this does not alter the interpretation of the facts.

while when *rubrinervis* pollen is used the *nanella*-carrying eggs of *Lamarckiana* disappear. Will anyone be found willing to support such an hypothesis?

But the difficulties with a Mendelian interpretation of these crosses have only begun. How are we to account for the fact that both *Lamarckiana* and *nanella* from the F_1 of *Lamarckiana* × *nanella* breed true? On the Mendelian assumption it must be because in these *Lamarckiana* plants the *nanella*-carrying germ cells all degenerate, either in the pollen or the egg cells or both. Otherwise when selfed they would produce *nanella* in F_2. Is this degeneration a reasonable assumption when we know that in *rubrinervis* × *nanella* some of the *rubrinervis* plants appearing in F_1 when selfed split out *nanella* in a ratio which is, in some cases at least, close to 3:1? That is, we know that *rubrinervis* plants which are heterozygous for *nanella* develop their two types of germ cells according to regular Mendelian expectation, and it would be, to say the least, highly improbable that the closely related *Lamarckiana* would behave in an entirely different manner and that its *nanella* germ cells (assuming that there are such) would degenerate.

Another fact which East must explain is this: Why is it that *Lamarckiana* × *nanella* yields dwarfs in F_1 while *rubrinervis* × *nanella* only yields them in F_2, or in other words why is it that the first result is a mutation cross while the second is a Mendelian result as regards the dwarf character? So far as I am aware, no Mendelian has attempted to offer an explanation of this significant fact.

There is yet another fact in this connection which has not even been considered, still less explained, by the critics. This is that while *Lamarckiana* gives rise to the mutant *nanella*, *rubrinervis* has never been known to do so in all the extensive cultures. Is it unreasonable to connect these facts with those mentioned in the last paragraph?

The mutationist conception on the other hand, while it may not furnish a complete explanation, at least enables us to consider all these facts under a consistent point of view and does not lead to any of the absurdities which lurk in a Mendelian interpretation. Moreover, it offers an explanation of whole classes of facts which no Mendelian writer has attempted to explain. Let us consider this conception as it applies to the facts we have cited. DeVries has assumed that pangens, or if you like, factors for the differences between the mutants and their parent *Lamarckiana*, may exist in

three conditions, (1) labile, (2) active, (3) inactive; that, *e. g.*, the *nanella* pangen or factor for tallness is labile in *Lamarckiana* since that species can give rise to *nanella* through a mutation, while it is only active in *rubrinervis* since the latter can not give rise to *nanella*. In *nanella* it is considered inactive rather than absent. Correlated with this is the fact that, as we have seen above, *Lamarckiana* × *nanella* splits off dwarfs in F_1, while *rubrinervis* × *nanella* splits them off in Mendelian fashion, *i. e.*, in F_2.

Instead of the impossible and self-contradictory assumptions regarding degeneration of certain classes of germ cells or zygotes in the various crosses, DeVries made the one assumption that in the zygotes of, *e. g.*, *Lamarckiana* × *nanella* either one or the other form or condition obtains ascendency, to the complete exclusion of the other form in later generations. This view is at least self-consistent, which cannot be said of the Mendelian "explanation." If any Mendelian can suggest an alternative explanation which avoids the pitfalls pointed out above, we shall be glad to see it. We have shown at any rate that in the particular group of crosses considered above, the attempt to hide behind sterility as a means of offering a Mendelian explanation only leads to difficulties. So far as we can see, the Mendelian explanation fails hopelessly in all these cases and in others as well.

It will be time enough to consider East's other objections to the point of view of my book when the points discussed above have been cleared up.

AN OVERLOOKED ENVIRONMENTAL FACTOR FOR SPECIES OF PRUNUS.

Roland M. Harper.

In the March number of Rhodora, pages 66–70, Mr. Bayard Long reports finding *Prunus cuneata* on the southeast side of a creek or small river in the pine-barrens of Ocean County, New Jersey, especially on a gravelly railroad embankment in the creek swamp; and he discusses at some length the question of whether it can be native there, in view of the fact that no other stations for it are known within many miles.

A minor point in his discussion may as well be disposed of first. Assuming that the plants at the top of the railroad cut nearest the creek are indigenous, it probably matters little whether the soil of the neighboring embankment where they grow more luxuriantly came from that cut or a thousand miles away, for the seeds are just as likely to have been transported to that spot by birds or other animals as in the cars that hauled the earth many years ago.

Mr. Long did not seem to grasp the significance of the location of his plants with reference to the creek swamp. The typical pine-barrens of New Jersey, as is well known, are burned over every few years; but the edge of a swamp, being protected on one side, is less subject to fire, especially *on the side away from the main body of pine-barrens*, as in the present instance; and a gravelly embankment in a swamp ought to be almost wholly exempt from fire.

Plants not provided with thick bark or subterranean stems cannot endure frequent fires, and no species of *Prunus* (including the sections or subgenera *Padus*, *Cerasus*, etc.), in eastern North America at least, seems to be very well protected in either of these ways. Of those the writer is acquainted with, *P. serotina*, *P. umbellata*, *P. Americana*, *P. Caroliniana* and *P. sphaerocarpa* grow mostly in rich woods, where there is too little undergrowth to make much of a blaze. *P. angustifolia* is a weed of old fields and fence-rows, and *P. serotina* is found in such situations about as often as in natural habitats. *P. Pennsylvanica* is one of the characteristic "fireweeds," that spring up in the intervals between fire in the northern coniferous forests, and *P. pumila* and *P. maritima* prefer sandy and rocky shores, where the vegetation is too sparse to carry fire and the water affords protection on one side. *P. Besseyi* grows in the barrenest places on the sand-hills of Nebraska and neighboring states, where the vegetation is sparsest,[1] and *P. geniculata* on high sandy hills in the lake region of central Florida, where fire is less frequent than in the more grassy typical pine-barrens.[2]

Possibly some reader may recall seeing some species of *Prunus* touched by fire and not killed; but a few exceptions will not materially affect the truth of the assertion now made that fire, whether of natural or artificial origin, is much less frequent in the habitats affected by

[1] See Pool, Minn. Bot. Stud. **4**: 230, 236, 239. 1914; and review in Bull. Am. Geog. Soc. **47**: 873–874. 1915. The writer made the acquaintance of this shrub in northeastern Colorado after that review was written.

[2] See Torreya **11**: 64–67. 1911.

species of *Prunus* than in the case of some other woody plants, the pines and oaks for instance. The interested reader may find it worth while to study the statements about the habitats of *Prunus* in Sargent's Silva, Wight's Native American species of Prunus (U. S. Dept. Agr. Bull. 179. 1915), and some of the more elaborate local floras, such as the recent flora of Connecticut by Graves and others, Stone's flora of southern New Jersey (referred to by Mr. Long, and reviewed by the writer in Torreya **12**: 216–225. 1912), Kearney's Botanical Survey of the Dismal Swamp region, and Mohr's Plant Life of Alabama.

Many other genera of plants of course are just as sensitive to fire as *Prunus* is, and any one who wishes to look further into the effects of this neglected environmental factor can find references and cross-references in the following places:— Bull. Torrey Bot. Club **38**: 522. 1911, **41**: 217. 1914; Torreya **12**: 147, 219. 1912; **15**: 30. 1915; Geol. Surv. Ala. Monog. **8**: 211. 1913; Pop. Sci. Monthly **85**: 338. 1914; Ann. Rep. Fla. Geol. Surv. **6**: 184–185, 282–283, 286, 442. 1914; **7**: 143, 147–148, 165, 335. 1915.

College Point, New York.

Reprint of a rare Book on American Plants. — Mr. S. N. Rhoads of Philadelphia has made accessible to botanists, through reprinting, "the earliest published book, written by an American Botanist and devoted exclusively to American Botany, Horticulture and Floriculture." [1] This work is divided into two parts, 1. Catalogue d'Arbes, Arbustes, et plantes herbacées d'Amérique. 2. Liste des Arbres, Arbrisseaux & Plantes qu'on ne peut se procurer que par des voyages dispendieux dans le continent de l'Amérique, & que M. Yong n'a point encore élévés en assez grand nombre pour les envoyer en Europe. Many of the names are binomials and some of them are characterized as "nova species," but the descriptions are so meager and vague that they have little defining power, as for instance "*Angelica pastinaca, nova species.* Elle a 5 pieds de haut & croit dans un sol marécageux," and, therefore, they should not be taken up to displace names with good descriptions made later. This old book has been neglected or overlooked for many years. It does not appear in the botanical bibliographies and the new names are not cited in the Index Kewensis. William Young Jr., the author, was a nurseryman and a gardener, a near neighbor of John Bartram

[1] M. Yong [William Young, Jr.] Catalogue d'Arbres, Arbustes et plantes herbacées d'Amérique — Paris, 1783.

of Philadelphia. He sent and carried many living plants to England for cultivation and was appointed "Queen's Botanist." Mr. Rhoads's task in searching out so thoroughly the history of W. Young has not been an easy one but he has brought together a good account of this man and his work, and while the catalogue is not of great scientific value it has much historical interest.— MARY A. DAY.

A POPULAR HANDBOOK TO THE MOSSES.— Mrs. Elizabeth M. Dunham in "How to Know the Mosses," [1] has undertaken to provide a handbook which will not require the use of a lens of any kind. When one considers that a convenient hand-lens costs only $1.50, and that there is already available such a satisfactory book as Dr. Grout's "Mosses with a Hand-lens," it seems to the reviewer doubtful if the task that Mrs. Dunham has attempted is worth while. Her book should be judged, however, by its purpose, which is to enable "people who are content to recognize violets, asters, and goldenrods, without knowing the specific names .... to know the generic names of mosses." The descriptions show that Mrs. Dunham has a good knowledge of the plants with which she is dealing. The illustrations are very simple, but in general they suggest the habit of the moss to one who is already familiar with it; whether they would be sufficiently suggestive to a beginner is open to question. Photographs would have been much better but would, of course, have added greatly to the cost of the book. A casual testing of the keys seems to indicate that they work out as well as could be expected. No handbook will eliminate the need of judgment and patience, and equipped with these the possessor of "How to Know the Mosses" will have an opportunity to be introduced to a fascinating group of plants, and, we may hope, will be led on to purchase lens and microscope and the more "scientific" books by Dr. Grout.

Upon opening this book and seeing its thirty pages of non-technical keys, the reviewer was reminded of his first, unaided attempt to learn the mosses nearly twenty years ago. Lesquereux and James's Manual was then the only available book, and the would-be student found no keys except the technical analysis of genera at the beginning of the book. After grappling with the heading "capsule sessile on a pedicellate vaginule," he was then confronted by "calyptra mitriform." The moss in hand had no calyptra; no one stood by to say that it was of no consequence; and the attempt to know mosses proceeded no further at that time! Whatever difficulties are encountered in the use of Mrs. Dunham's book, they will certainly not be due to technicalities.— L. W. R.

[1] Houghton, Mifflin Company, Boston, Mass. 1916. $1.25 net.

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Rhodora

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SOME HISTORICAL DATA REGARDING THE SWEET BAY AND ITS STATION ON CAPE ANN.

George G. Kennedy.

[During the preparation of the current installment of the Reports on the Flora of the Boston District the Committee in charge of this work of the New England Botanical Club received the suggestion that as *Magnolia virginiana* L.— a species long familiar under the now discarded name of *M. glauca* L.— was included in this section of the catalogue and as the circumstances regarding the discovery of its isolated and highly interesting station near Gloucester, Massachusetts, had been the subject of some doubt and controversy, it would be desirable at this time to assemble the facts concerning the unhappily vanishing northeastern colony of this noteworthy plant — one of the rarest in the flora of New England. Acting upon this excellent suggestion the Committee applied to Dr. George Golding Kennedy, who was known to have information upon the subject.

At the request of the Committee and from his own extensive botanical and historical library, rich in Americana, Dr. Kennedy has most kindly sought out and brought together many references to the Sweet Bay. While he disclaims originality in his article it is confidently believed that the facts here assembled from sources, several of which are rare and accessible to few, will prove decidedly welcome to the readers of Rhodora. Their points of chief interest are in fixing the date at which the station was first noticed, as well as in clarifying the identity of the discoverer; also in placing on record the condition of the colony at different dates within recent decades. It is hoped that more general knowledge of the history and biological interest of this vanishing member of the New England flora will stimulate care in the protection of the remaining individuals and will promptly stop any tendency to deplete the station further.— Ed.]

The beauty, fragrance and novelty of the Magnolias of the Southern states early attracted the attention of the explorers, farmers and botanists.

Plumier in his Nova plantarum Americanarum genera, p. 36, pl. 7 (Paris, 1703) gave the name in honor of Magnol, a professor of botany at Montpelier, France, and also gave what for the times was a good plate of the details of the structure of the flower. He says he has seen but one species. Linnaeus adopted most of Plumier's generic names, and among them *Magnolia*.

Clayton in his Flora Virginica, ed. 2, p. 83 (1762) cites (although without binomial designations) several species of the genus, among them *Magnolia glauca*, the shrub or low tree popularly called Swamp Laurel or Beaver Tree, which was in fact the most plentiful in number and most fragrant in flower, as well as most kindly disposed to transplanting.

Many gardens in England, France and Spain had plants of American origin before the end of the 17th century. In the next century the pupils of Linnaeus spread themselves over a large part of Europe as well as over New Spain and the more easily explored coast line of the Atlantic Ocean from Florida to the islands of the St. Lawrence valley. Of these travellers Peter Kalm kept a journal of his wanderings and discoveries. Under the date of Oct. 20, 1748, he gives two pages (vol. i. pp. 160-161 in Forster's English translation, Ed. 2) to the *Magnolia*, which must have been pleasant reading for those old colonial days.

"Oct. the 20th. The *Beaver tree* is to be met with in several parts of *Pensylvania* and *New Jersey*, in a poor swampy soil, or on wet meadows. Dr. *Linnæus* calls it *Magnolia glauca*. Both the *Swedes* and *English* call it *Beaver tree*, because the root of this tree is the dainty of beaver, which are caught by its means, however the *Swedes* sometimes gave it a different name, and the *English* as improperly called it *Swamp Sassafras* and *White Laurel*. The trees of this kind dropt their leaves early in autumn, though some of the young trees kept them all the winter. I have seldom found the beaver tree north of *Pensylvania*, where it begins to flower about the end of *May*. The scent of its blossoms is excellent, for by it you can discover within three quarters of an *English* mile, whether these little trees stand in the neighborhood, provided the wind be not against it. For the whole air is filled with this sweet and pleasant scent. It is beyond description agreeable to travel in the woods about that time, especially towards night. They retain their flowers for three weeks, and even longer, according to the quality of the soil on which the

trees stand; and, during the whole of their being in blossom, they spread their odoriferous exhalations. The berries likewise look very fine when they are ripe, for they have a rich red color, and hang in bunches on slender stalks. The cough, and other pectoral diseases, are cured by putting the berries into rum or brandy, of which a draught every morning may be taken; the virtues of this remedy were universally extolled, and even praised for their salutary effects in consumptions. . . . and it was thought that a decoction of it could stop the dysentery. Persons who had caught cold, boiled the branches of the beaver tree in water, and drank it to their great relief."

Mark Catesby in his considerable and important work The Natural History of Carolina, Florida, and the Bahama Islands (2 vols. folio, London, 1771) gives at page 39 an account of the Sweet Flowering Bay with an excellent plate and description. A portion of the text runs: "They [*i. e.* these trees] grow naturally in moist places, and often in shallow water; and what is extraordinary, they being removed on high dry ground, become more regular and handsomer trees, and are more prolific of flowers and fruit. They usually lose their leaves in winter, except it be moderate."

"This beautiful flowering tree is a native both of Virginia and Carolina and is growing at Mr. Fairchild's in Hoxton and Mr. Collinson's at Peckham [England] . . . requiring no protection in our coldest winters."

One of the earliest volumes on Materia Medica Americana, namely that of David Schoepf, printed at Erlangen, Bavaria, in 1787, has on page 91 an old-fashioned list of pharmaceutical uses of *Magnolia glauca*, from the aromatic bitter of its bark to its ashes made into an ointment for ulcers. This book shows at least how much value was given to the very noticeable tree.

On pages 139 and 140 in the first edition of his Plants of Boston, published in 1814, Dr. Jacob Bigelow says of *Magnolia glauca:* "The only species of this superb genus, that has been found native in our climate. It attains the height of a dozen feet, but is sometimes killed down to the roots by severe winters. . . . The bark is highly aromatic, and possesses medicinal properties. It grows plentifully in a sheltered swamp at Gloucester, Cape Ann, twenty five miles from Boston, which is perhaps its most northern boundary.— June, July."

Magnolia glauca is similarly treated in the 2nd edition of the same

work in 1824, and in the 3rd edition in 1840; also in Bigelow's Medical Botany, vol. ii. pp. 67–70, where it is called an aromatic tonic.

Stephen Elliott in his Sketch of the Botany of South Carolina and Georgia, vol. ii. p. 37 (1821), says: "This is probably the most fragrant plant of our forests. It grows in great profusion along the margin of the rich swamps which border our rivers, and in the morning and evening during the period of its flowering, the atmosphere of our streams is often literally perfumed with its fragrance."

"Grows in swamps and wet soils, though extremely abundant in the low country of Carolina — it is very rarely found upon the islands which border the sea coasts."

Darlington in his classical Flora Cestrica, ed. 3, p. 8 (1853), made the following comments upon the species: "This delightful little tree, though abundant in the swamps of New Castle County, on the south of us, is rare in Chester County."

Dr. Francis Peyre Porcher in his Resources of the Southern Fields and Forests (Charleston, So. Car., 1863), pp. 36–37, speaks almost entirely of its pharmaceutical value in many cases of a typhoidal character: "The bark of the root, according to Griffith, was employed by the Indians to fulfil a variety of indications; the warm decoction acts as a gentle laxative, and subsequently as a sudorific, whilst the cold decoction, powder of, or tincture, is tonic. . . . It is supposed by many residing in the lower portions of this state that this tree prevents the water of bogs and galls from generating malaria. It certainly seems that the water is much clearer in which the bay tree grows."

George B. Emerson in his Trees and Shrubs of Massachusetts, ed. 2 (1875) and without change ed. 3 (1878), p. 603, says,

"A sheltered swamp near Cape Ann, not far from the sea, is thought to be the most northern habitation of this plant, and until lately was supposed to be the only one in Massachusetts. It has recently been found at the distance of some miles, in another swamp, in the midst of deep woods in Essex."

At this point there is a reference to the following foot-note.

"It is said to have been found, in a single spot, in the county of York, Maine."

No specimen, however, from Maine exists in any herbarium to my knowledge. The text continues: "From these situations it will soon be completely extirpated. The fragrant flowers and even the leaves are in such request, that, early in the flowering season, numbers of

persons resort to the swamps in quest of them, and great quantities are annually carried to Salem and Boston for sale. The gatherers of the flower are regardless of the preservation of the trees; and in a single season I have noticed scores of them broken down and almost entirely destroyed." ....

"No plant is, at every season and in every condition, more beautiful. The flower, two or three inches broad, is as beautiful and almost as fragrant as the water lily."

John Robinson in his Flora of Essex County (Salem, Mass., 1880), p. 31, under *Magnolia glauca* gives the following: "Gloucester and swamps towards Essex. First brought to notice by Rev. Manasseh Cutler during the last century."

The date in Mr. Cutler's Journal is given as Monday, July 28, 1806; so that the reading should have been "in the early years of the [then] present century" as no exact date was then available.

Lester F. Ward in his Guide to the Flora of Washington and Vicinity (1881), p. 63, makes the following record regarding *Magnolia* in the region of which he was writing. "In all swamps, but being rapidly destroyed by people in search of the flowers."

The species is apparently rare in Tennessee, as Gattinger in his Flora of Tennessee (1901), p. 79, gives but one station for it, namely, "Madison Co. W. Tenn. S. M. Bain."

In C. S. Sargent's Manual of the Trees of North America (1905), p. 318, occurs the following: "Most abundant and of its largest size in the interior of the Florida peninsula on fertile hummocks rising above the level of the Pine-lands."

"Often cultivated as a garden plant in the eastern states and in Europe."

In Garden and Forest, vol. iii. p. 23 (1890), there is a valuable note by Mr. T. O. Fuller of Needham, Mass., which I copy in full.

"To the Editor of Garden and Forest: Sir.—In regard to the Massachusetts station of Magnolia glauca, noticed in Garden and Forest (ii. 612), the following may be of interest to some of your readers:

'The first specimen of the *Magnolia glauca* noticed in Massachusetts was brought from Cape Ann Woods in the summer of 1805, by the late Chief Justice Parsons. He observed a number of plants in flower as he was journeying on that road, and being struck with their beautiful appearance, gathered a few, which he brought to Boston for examination by his friends. I happened to be at his house on the day he returned from his journey. He showed me

his acquisition, and wished to know what it was. I took one of the specimens home for examination, and found it to be *Magnolia glauca* — a most unexpected inhabitant of our region. *J. D.*'

The above is a marginal note, written by Judge John Davis, of Boston, in his copy of the first edition of Bigelow's 'Florula Bostoniensis' (a presentation copy to 'Judge Davis from his friend and serv't, the author') on the page where the *Magnolia* is described."

In Dr. Cutler's Diary occurs the following:

"July 28, 1806. Monday.

Hon Theophilus Parsons informed me by letter last evening that he had found the *Magnolia glauca* in a swamp on the road from Manchester to Gloucester. I set out in search of it. Dined at Captain Ingolson's, at Kettle Cove, where Mr. Goldsmith brought me a tree of it, without knowing I was in search of it. Found it in plenty, in two swamps on the new read [sic] to the left.

Went to Fresh-Water Cove, near the harbor of Gloucester, made a large botanical collection, and returned."

We are fortunate in having a much fuller account of this discovery in the Life, Journals and Correspondence of Rev. Manasseh Cutler, L.L.D. (published in Cincinnati, in 1888, by Robert Clarke & Co.). The following letter from Judge Parsons to Dr. Cutler, written in July, 1806, I will quote entire.

Reverend and Dear Sir:

In riding through the woods in Gloucester, that are between Kettle-Cove and Fresh-Water Cove I discovered a flower to me quite new and unexpected in our forests. This was last Tuesday week [July 22, 1806]. A shower approaching prevented my leaving the carriage for examination, but on my return, on Friday last, I collected several of the flowers, in different stages, with the branches and leaves, and on inspection it is unquestionably the Magnolia glauca. Mr. Epes Sargent has traversed these woods for flowers and not having discovered it, supposes it could not have been there many years. It was unknown to the people of Gloucester and Manchester until I showed it to them. I think you have traversed the same woods herborizing. Did you discover it? If not, how long has it been there? It grows in a swamp on the western or left side of the road as you go from Manchester to Gloucester, and before you come to a large hill over which the road formerly passed. It is so near the road as to be visible even to the careless eye of the traveler. Supposing the knowledge of this flower, growing so far north, might gratify you, I have made this hasty communication.

Your humble servant,

Theoph. Parsons.

Rev. Dr. Cutler.

This letter of Judge Parsons conclusively fixes the date of the discovery of the Sweet Bay in Gloucester as July 22nd, 1806, and shows clearly the identity of the discoverer as the Hon. Theophilus Parsons. From a Life of Judge Parsons it is clear that the study of plants was one of his favorite recreations. At the time of the discovery of the *Magnolia* he was fifty-six years of age and was living on Pearl Street, Boston, in a house with a large garden.

The date 1805, given by Judge Davis, in the note cited above, is plainly an error. The marginal memorandum in his copy of Bigelow's Florula Bostoniensis written a number of years after the discovery can surely carry little weight as evidence compared with a letter written by the discoverer at the time of the discovery.

In the Life of Rev. Manasseh Cutler, vol. ii. p. 359, one of his grandchildren tells of his home at Hamilton, Mass., with his garden where were to be seen many transplanted trees and shrubs. "Here grew the pawpaw and persimmon by the side of strange foreign plants; and in a swamp, not distant, flourished a transplanted Magnolia, and in the garden a large tulip-tree."

Regarding the origin of the colony and its present sadly depleted state the following communications are of much interest.

In Garden and Forest, vol. ii. p. 363 (1889) J. G. Jack gives nearly a page on the Magnolia of Essex Co., Mass., including some parts of its early history. And an unsigned correspondent in the same volume on page 612 gives some suggestive hints as to its possible introduction. I copy this note complete. "Magnolia Swamp contains several hundred acres, and it is one and a half miles in length and from ten to over 100 rods in width. I am of the opinion that this swamp has furnished the shrub to all the others. In regard to three of the smaller swamps I know that this is a fact, the Magnolia shrubs having been transplanted by men. The inhabitants of Gloucester are firm in the belief that *Magnolia glauca* is a native shrub, but I cannot think so.

I believe it was introduced by the old settlers, some of whom may have lived in and removed from a more southern state. 'The old Salem road' deserted by the travelling public for over 100 years, skirts the eastern side of Magnolia Swamp. Along the line of this road are the ruins of old cellars, and in the swamp opposite one of the cellars, near a spring, may be found Magnolias which appear the oldest in the region. The root-crowns below the moss are often found to be two feet in diameter. In no other place can I find such a growth, and

it is here, I think, that the shrub first started. It must be evident to any careful observer that *Magnolia glauca* is struggling here in an unnatural climate. The primary roots grow straight down into the muck, and in the fall are thickly covered with rootlets, snowy white in color. In the spring these rootlets are mostly dead, and a greater part of young shoots die down to the moss, and a certain per cent of the old plants are winter-killed, which indicates that there is no harmony between shrub and climate."

Mr. Walter Deane has given me the following letter from Mr. C. E. Faxon which shows the condition of the swamp in the summer of 1913.

April 17, 1916.

Dear Mr. Deane:

I have just found in Garden and Forest an interesting letter from Mr. Fuller giving a marginal note from Judge Davis's copy of Bigelow's Plants of Boston. . . . When I first visited the swamp some 45 years ago there were plenty of good specimens all about, sometimes 15 feet tall or more. It was easy to find them, as the boys who sold the flowers on the Boston trains had made trails from one plant to another all over the swamp.

When I visited the place with Dr. Kennedy two years ago we found with the aid of the Tree Warden of the town, only two little plants a few feet high that had escaped the Magnolia hunters — such had been the destruction!

Yours faithfully,

C. E. Faxon.

From this it is plainly evident that unless some prompt measures are taken for its safety we shall very soon have seen the last of this delightful flower in our Massachusetts flora.

Readville, Massachusetts.

An early Flowering of Rudbeckia hirta.— On April 25, 1916, I discovered on the campus of the Massachusetts Agricultural College a plant of *Rudbeckia hirta* (Black-eyed Susan) in bloom. It had a very short stem and was found in an exposed, sunny situation on a slope. Gray gives the time of blooming of this species as from June to September.— William S. Coley, Massachusetts Agricultural College, Amherst, Massachusetts.

REPORTS ON THE FLORA OF THE BOSTON DISTRICT,—XXIV.

MAGNOLIACEAE.

MAGNOLIA.

M. virginiana L. West Gloucester, in swampy woods towards Essex, north of Magnolia village. As much interest is attached to this northernmost and isolated station for the Sweet Bay, a paper on this subject has been on request kindly contributed by Dr. George G. Kennedy and appears in this issue of RHODORA.

BERBERIDACEAE.

BERBERIS.

B. VULGARIS L. Rocky woods and pastures, an early introduction from Europe; common throughout. A seedless form, var. ASPERMA has been found in an old pasture at Sherborn by Miss Martha L. Loomis. See RHODORA xiv. 207, 1912.

CAULOPHYLLUM.

C. thalictroides (L.) Michx. Rocky woods, Georgetown (*Mrs. C. N. S. Horner*, 1873); rocky woods in rich shady ravine, Boxford (*G. G. Kennedy*, May 23, 1906; *E. F. Williams*, Aug. 9, 1906); low ground, Concord, introduced by Minot Pratt, persistent but not increasing (*E. F. Williams*, May 8, 1898).

PODOPHYLLUM.

P. PELTATUM L. Introduced and in some cases spreading at Salem, Chelmsford, Concord, Natick, Sherborn; Framingham and Burlington, according to Dame & Collins, Fl. Middlesex Co. 3, 1888.

LAURACEAE.

BENZOIN.

B. aestivale (L.) Nees. Swampy woods and wet places, frequent throughout.

SASSAFRAS.

S. variifolium (Salisb.) Ktze. Dry woods and thickets, frequent throughout.

S. variifolium (Salisb.) Ktze., var. **albidum** (Nutt.) Fernald. See Rhodora xv. 14–18, 1913. Occasional throughout.

PAPAVERACEAE.

ARGEMONE.

A. mexicana L. A fugitive from Mexico; reported from Lynn, Cambridge and Dorchester.

CHELIDONIUM.

C. majus L. A weed in moist soil, common throughout. Introduced from Europe prior to 1669 (John Josselyn, New England Rarities Discovered, 1672).

ESCHSCHOLTZIA.

E. californica Cham. California Poppy. Vacant lot in refuse, Fenway, Boston (*C. H. Knowlton*, Sept. 6, 1910). A well-known garden flower, native of California and Oregon.

PAPAVER.

P. Rhoeas L. Brookline, rare (*J. H. Foster*, 1869); Blue Hills, house-site (*F. S. Collins*, Sept. 2, 1895); open place in woods, persistent from 1905 to 1911, Newton (*F. W. Grigg*).

P. somniferum L. Garden escape; Georgetown, Dorchester, Scituate.

SANGUINARIA.

S. canadensis L. Moist soil in or near woods; frequent from Blue Hills and Hingham northward, either lacking or rare in southern towns.

FUMARIACEAE.

ADLUMIA.

A. FUNGOSA (Ait.) Greene. Garden escape at Georgetown, Manchester, Salem, Lowell and Dorchester.

CORYDALIS.

C. sempervirens (L.) Pers. Dry soil, often on ledges; frequent throughout. A yellow-flowered form was collected by J. R. Churchill on waste ground, Warren Farm, Brookline, July 21, 1897.

DICENTRA.

D. CANADENSIS (Goldie) Walp. Introduced by E. H. Hitchings in low deciduous woods Purgatory, Norwood, a dense patch made up of this and *Dentaria diphylla* (*R. A. Ware*, Apr. 15, 29, May 13, 1905).

D. Cucullaria (L.) Bernh. Salt Island, Gloucester (*Mrs. Babson*, May 16, 1875); rocky hill pasture, Cross's Island, Essex (May, 1909).

D. EXIMIA (Ker) Torr. Follansbee's, Haggett's Pond, Andover (*C. W. Swan*, Aug. 6, 1880, specimen in herb. Yale University).

FUMARIA.

F. OFFICINALIS L. Gardens and waste places, frequent.

CRUCIFERAE.

ALYSSUM.

A. ALYSSOIDES L. A weed at ten scattered stations, rare.

ARABIS.

A. canadensis L. Dry rocky woods and hillsides; occasional from Hingham and Blue Hills northward.

A. Drummondi Gray. Rocky places, often in woods; frequent north of Boston.

A. glabra (L.) Bernh. Fields and dry soil; Boxford, N. Andover, Lowell, Revere, Medford, Hingham, Wellesley.

A. viridis Harger. See Rhodora xiii. 37–39, 1911. Ledges and rocky hills; Melrose, Middlesex Fells, Woburn, Medford, W. Roxbury, Littleton.

BARBAREA.

B. verna (Mill.) Asch. Rubbish heap, Cambridge (*M. L. Fernald & C. A. Weatherby*, May 26, 1909); Wellesley (*K. M. Wiegand*, May 29, 1912); moist field, Sharon (*C. H. Knowlton*, May 19, 1907).

B. vulgaris R. Br. Wet places, common throughout.

B. vulgaris R. Br., var. longisiliquosa Carion. See Rhodora xi. 134–141, 1909. Wet places, frequent.

BERTEROA.

B. incana (L.) DC. Fields and waste places, occasional.

B. mutabilis (Vent.) DC. Hingham (*T. T. Bouvé*, September, 1894); roadside near station, Dedham (*E. F. Williams & Sidney Harris*, Aug. 22, 1897); cultivated ground, Walpole, one plant (*R. A. Ware*, Aug. 26, 1911).

BRASSICA.

B. alba (L.) Boiss. Waste ground, rare.

B. arvensis (L.) Ktze. Fields and waste places, common throughout.

B. campestris L. Fields, gardens and waste places, common.

B. japonica Siebold. Ash dump, Stoneham (*Miss H. A. Ward*, July 1, 1910); Lexington, according to Mabel P. Cook, Rhodora i. 81, 1899. Self-perpetuating in gardens.

B. juncea (L.) Cosson. Fields and waste places, common.

B. nigra (L.) Koch. Waste places, frequent.

B. oleracea L. Waste places and gardens, sometimes persistent for a year.

B. Rapa L. Fields and waste places, Andover, Winchester, Bedford, Waltham, Milton.

CAKILE.

C. edentula (Bigel.) Hook. Sandy and gravelly seashores, all along the coast.

CAMELINA.

C. MICROCARPA Andrz. Waste places, occasional.
C. SATIVA (L.) Crantz. Waste places, occasional.

CAPSELLA.

C. BURSA-PASTORIS (L.) Medic. Gardens and waste places, very common throughout.

CARDAMINE.

C. bulbosa (Schreb.) BSP. Swamps and wet woods; frequent near Boston, but not reported from outlying portions of our district.

C. parviflora L. Ledges and open woods in central third of district. The plant seems to have a marked soil-preference for the diorite hills.

C. pennsylvanica Muhl. Brooks and wet places, very common throughout.

C. pratensis L. Wet meadows, casual at Georgetown (*Mrs. C. N. S. Horner*, no date); spreading in a lawn, Woburn (*Marion T. Hosmer*, May 12, 1912); very abundant along Stony Brook in Weston.

CONRINGIA.

C. ORIENTALIS (L.) Dumort. Fields and waste places, Westford, Boston, Dedham, Sherborn, Wellesley.

CORONOPUS.

C. DIDYMUS (L.) Sm. Lawns and waste places, Boston, S. Boston, Cambridge, Wellesley.

DENTARIA.

D. diphylla Michx. Rich moist woods; Cambridge, Concord (introduced), Lowell, Norwood (introduced); Arlington (*E. Tuckerman*),

Belmont, specimen in the Boott herbarium according to Dame & Collins, Fl. Middlesex Co. 6, 1888. Apparently very rare in our district.

D. maxima Nutt. Lowell (*W. P. Atwood*, May, 1883, specimen in herb. N. E. Botanical Club). This is *D. heterophylla* of Dame & Collins, Fl. Middlesex Co. 6, 1888.

DIPLOTAXIS.

D. MURALIS (L.) DC. Waste land, Chelsea (*H. A. Young & C. E. Perkins*, Sept. 5–12, 1879; specimen in herb. N. E. Botanical Club).

D. TENUIFOLIA (L.) DC. Charlestown (*C. E. Perkins*, Sept. 23, 1880; specimen in herb. N. E. Botanical Club).

DRABA.

D. caroliniana Walt. Rocky hillsides, Salem Neck; first found by Dr. Charles Pickering in 1824; last report from J. H. Sears, May 18, 1901: Woburn (*C. E. Perkins*, June 2, 1882 and June, 1883).

D. VERNA L. Dry soil, Danvers (since 1826), Peabody, Salem, Medford, Cambridge, Wellesley.

ERUCASTRUM.

E. POLLICHII Schimp. & Spenn. See RHODORA xiii. 10–12, 1911. Gravelly soil by railway, Sherborn (*Martha L. Loomis*, Sept. 4, 1910).

ERYSIMUM.

E. cheiranthoides L. Waste places, occasional throughout.

E. PANNONICUM Crantz. Woolen-mill yard, Graniteville, Westford (*C. W. Swan*, Aug. 12, 22, 1883; specimens in herb. Yale University and N. E. Botanical Club). Native of Europe. *E. repandum* of Dame & Collins, Fl. Middlesex Co. 7, 1888, of which no specimens can be found, is doubtless of this species, as the specimens were collected in the same locality only one and two years later.

E. REPANDUM L. Uphams Corner, Dorchester (*C. W. Swan*, July 18, 1885; specimen in herb. Yale University). Native of Europe, western Asia and northern Africa. Prof. B. L. Robinson has kindly identified this and the above species.

EUCLIDIUM.

E. SYRIACUM R. Br. Waif in hen-yard, Dedham (*C. H. Knowlton*, June 23, 1907, specimen in Gray Herb.). See RHODORA, x. 72, 1908.

HESPERIS.

H. MATRONALIS L. Persistent and spreading in old gardens, roadsides and waste places, frequent.

IBERIS.

I. AMARA L. Candytuft. Shawmut branch, N. Y., N. H. & H. R. R., Dorchester (*C. W. Swan*, July 11, 1885); probably casual elsewhere. Common in Europe, Asia Minor and Caucasus region.

LEPIDIUM.

L. APETALUM Willd. Dry roadsides and waste places, very common throughout.

L. CAMPESTRE (L.) R. Br. Waste places, frequent.

L. PERFOLIATUM L. Ballast ground, Chelsea bridge, Charlestown (*C. E. Perkins*, 188–, specimen in herb. N. E. Botanical Club). Native of southern Europe and the Orient.

L. RUDERALE L. Waste places, abundant in and about Boston; also at Gloucester, Chelmsford and N. Easton.

L. virginicum L. Roadsides, gardens and waste places, very common throughout.

LOBULARIA.

L. MARITIMA (L.) Desv. Garden escape; Salem, Cambridge, Roxbury, Dorchester.

NESLIA.

N. PANICULATA (L.) Desv. Hedgerow, Quincy St., Cambridge (*A. S. Pease*, July 31, 1908); Charlestown (*C. E. Perkins*, June 19, 1883); campus, Wellesley, one record only (*L. W. Riddle*, Sept. 14, 1909); railway tracks, Wellesley (*F. W. Hunnewell 2d*, —, 1914).

RAPHANUS.

R. Raphanistrum L. Fields and waste places, common throughout.

R. sativus L. Garden escape, occasional.

RAPISTRUM.

R. rugosum (L.) Berger., subsp. Linnaeanum (Boiss. & Reut.) Rouy & Fouc. Waste ground, Mill Dam, Boston (*C. E. Faxon*, —, 1873; specimen in Gray Herb.). A foreign introduction.

R. rugosum (L.) Berger., subsp. orientale (L.) Rouy & Fouc. Charlestown (*C. E. Perkins*, July 15, 1882; specimen in herb. N. E. Botanical Club). "This specimen is rather poor and doubtful, but it has the upper segment of the fruit abruptly contracted into a slender style, instead of attenuate, as in subsp. *Linnaeanum*," B. L. Robinson. A foreign introduction.

RORIPA.[1]

R. Armoracia (L.) Hitchc. Wet places, persistent and spreading; frequent throughout.

R. globosa (Turcz.) v. Hayek. Rubbish heap, Cambridge (*W. Deane*, Sept. 30, 1884; specimen in herb. W. Deane). A foreign introduction.

R. Nasturtium-aquaticum (L.) Schinz & Thell. Ditches and pools; frequent and abundant in central and southern portions, rare in Essex and northern Middlesex counties.

[1] In regard to the nomenclature of this genus, long familiar as *Nasturtium*, then changed to the earlier *Roripa*, then in certain recent works, such as the last edition of Gray's Manual, treated under the still earlier name *Radicula*, it may be said that in accordance with the first provision of Article 54 of the International Rules of Botanical Nomenclature the name *Radicula* must be abandoned since it is a morphological term. This being the case the next possible name is *Rorippa* Scop. Fl. Carn. ed. 1, 520 (1760), but this name seems to have been a misprint, for it was corrected by its author, Scopoli, in the second edition of the same work, to *Roripa*. Opinions differ as to whether this name must be accepted in its original form, *Rorippa*, as maintained by Briquet, Prodrome de la Flore Corse, ii. 28 (1913), or whether it may be allowed to stand in its corrected form, *Roripa*. In Art. 57 of the International Rules there is clear implication that typographical and orthographical errors in plant names may be corrected. The matter then resolves itself into the question whether the form *Rorippa* was in fact a typographical or orthographical error. The etymology of the name is not evident, but there would seem to be no clearer ground for supposing that a name was a misprint than the fact that it was consistently corrected in form by its author in his subsequent use of the name. It may be further stated that in using here the name in the form *Roripa*, we are following the example of the majority of writers who have accepted the name in either of its forms.

R. palustris (L.) Bess. Not reported southward, but frequent elsewhere.

R. palustris (L.) Bess., var. **hispida** (Desv.) Rydb. Nearly as common as the type.

R. SYLVESTRIS (L.) Waste places in moist soil, occasional.

SISYMBRIUM.

S. ALTISSIMUM L. Roadsides and waste places, well distributed. Introduced within 20 years.

S. LOESELII L. Woolen-mill yard, Graniteville, Westford (*C. W. Swan*, Aug. 22, 1883, specimen in herb. Yale University).

S. OFFICINALE (L.) Scop. Dump, W. Cambridge (*C. A. Weatherby*, July 10, 1909); near houses, Stoughton (*S. F. Blake*, July 4, 1911, July 13, 1912).

S. OFFICINALE (L.) Scop., var. LEIOCARPUM DC. Waste places, common throughout.

S. PANNONICUM Jacq. Roadside, Tewksbury (*C. W. Swan*, July 10, 1883); woolen-mill yard, Graniteville, Westford (*C. W. Swan*, Aug. 20, 1885). Specimens in herb. Yale University. A foreign introduction.

S. SOPHIA L. Waste ground, abundant in a small patch, wholly gone the next year, Chelmsford (*C. W. Swan*, June 15, 1884, specimen in herb. Yale University).

S. THALIANUM (L.) J. Gay. Waste ground off Parkway, Brookline (*F. F. Forbes*, May 10, 1907).

THLASPI.

T. ARVENSE L. Waste and cultivated ground, frequent.

[SISYMBRIUM INCISUM Engelm. and TROPIDOCARPUM GRACILE Hook. are reported from wool-waste at N. Chelmsford by Rev. W. P. Alcott in Dame & Collins, Fl. Middlesex Co. 8, 10, 1888. As Mr. Alcott's herbarium is not available for examination these records cannot be verified].

[ISATIS TINCTORIA L. is reported by Dame & Collins from Newton, on the basis of a specimen in herb. Boston Soc. Nat. History, collected by C. J. Sprague. As the specimen cannot now be found the record cannot be verified].

C. H. KNOWLTON, WALTER DEANE } *Committee on Local Flora.*

A NOTABLE MONSTROSITY OF ARISAEMA TRIPHYLLUM.

B. L. Robinson.

On June 4th, 1916, Dr. Horace Packard brought to the Gray Herbarium for examination and study a fresh specimen of the upper portion of an extraordinary Jack-in-the-Pulpit. He had discovered it in a low, slightly marshy spot, near a running brook, on the grounds of the Brae Burn Country Club, at West Newton, Massachusetts. The plant was about 3-4 dm. high and nothing unusual was noted regarding its foliage (which was not brought with the flowering stalk and has not been seen by the writer).

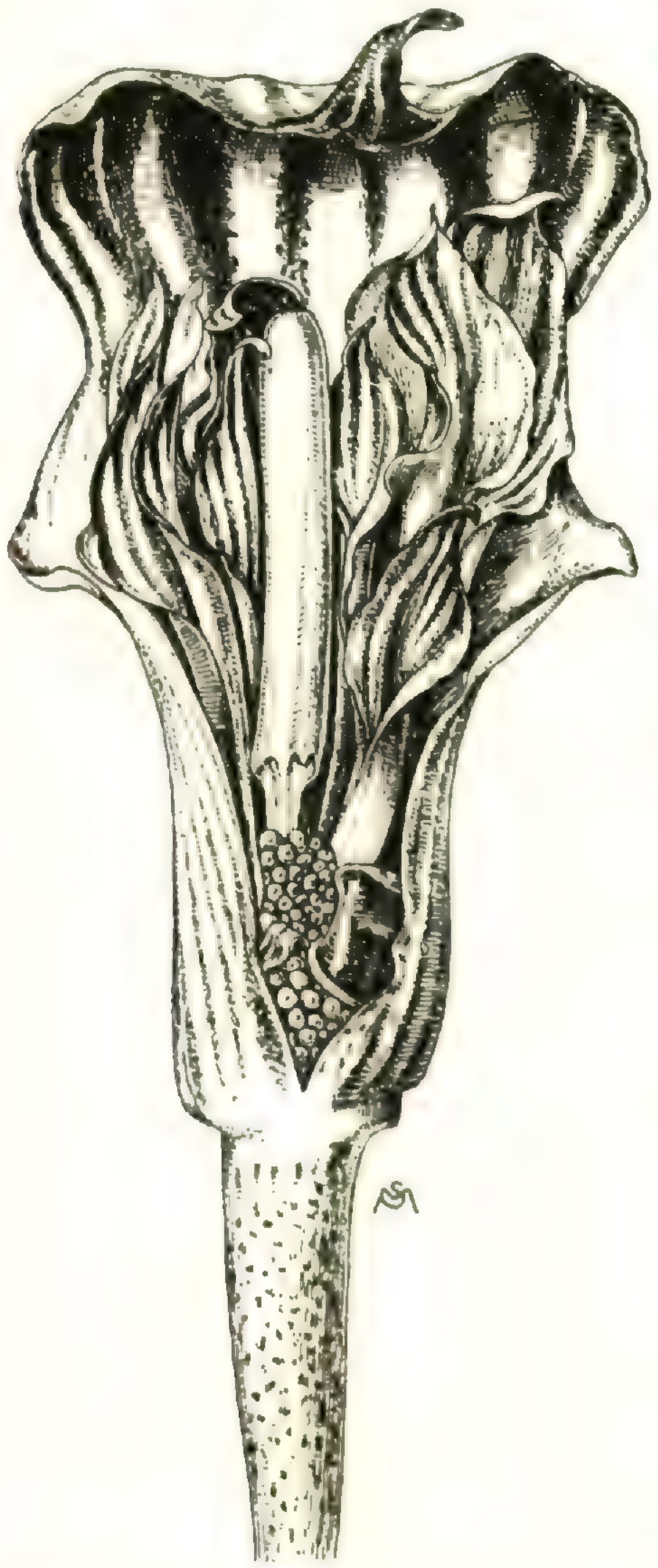

Fig. 1. Arisaema triphyllum with supernumerary spathes. × 1.

The conspicuous teratological features of the plant arise from the multiplication of the spathe or canopy-like floral bract. This usually single structure is here represented not merely by one main spathe, which is of unusual size though otherwise nearly normal form and markings, but within this are no less than twelve smaller spathes of varying sizes and proportionately slender development. All of these spathes arise at nearly the same height on the axis, the theoretically intervening internodes not being perceptible. The spadix is solitary and although unusually robust does not seem to show abnormality.

At one point, partially constricting the middle of the fertile portion of the spadix, is a broadish and striped belt-like structure, the nature

of which is not at first sight evident. However, examination shows that it is undoubtedly an imperfectly developed spathe, which appears to have been caught in this position while the inflorescence was in the bud-stage, and in consequence to have been distorted in its subsequent development.

As in the case of most monstrosities, no environmental factor was observed which would in any way account for the deformity. The scape is a little more than ordinarily robust, as is also the spadix, but both are symmetrical and show no flattening, grooving, or other evidence of fasciation.

The secondary spathes are wholly sterile. As will be seen from the admirable sketch drawn by Mr. F. Schuyler Mathews the spathes are of varying breadth and in some cases rather tightly in-rolled. Some are also considerably shorter than the others, and these being at the back in the interior of the main spathe cannot be shown in the drawing.

Exceedingly few teratological developments have been observed, or at least recorded, in *Arisaema triphyllum* and when it is borne in mind that the species is common, widely distributed, conspicuous and generally known, and also that it flowers at a time when collectors are in the first enthusiasm of a new open season, this is rather surprising.

The late Prof. W. W. Bailey [1] described briefly a garden specimen in which two spadices were observed in a single spathe. Later [2] he mentioned a specimen sent to him by Miss Eloise Butler of Minneapolis, in which a double spathe included a single spadix. Miss Alice G. Clark [3] describes and figures a more complicated case (found at East Weymouth, Massachusetts) in which two somewhat unsymmetrically related spathes enclosed three somewhat flattened and grooved spadices.

Prof. Packard has most kindly given to the Gray Herbarium the monstrosity here described and it has been preserved in alcohol.

Gray Herbarium.

[1] Bull. Torr. Bot. Club, ix. 91 (1882).
[2] Bot. Gaz. ix. 177 (1884).
[3] Rhodora, vi. 163 (1904).

Concerning Linum intercursum Bicknell.— In 1912[1] Mr. Bicknell proposed as a distinct species the yellow-flowered wild flax of the sand-plains of southern New England, Long Island and southward which had been referred to *Linum floridanum* by Small and by the editors of the Gray's New Manual, and gave it the name *Linum intercursum*. There can be little doubt that Mr. Bicknell's acute observation has detected a real difference between the two plants concerned: whether that difference is specific is, however, highly questionable. In the Gray Herbarium and that of the New England Botanical Club there are 26 sheets of *L. floridanum* and *L. intercursum*. A study of these shows six specimens intermediate in one character or another and indicates that neither in respect to the stature of the plants, the color, shape and texture of the leaves, the color and size of the capsules, nor the ciliation of the false septa (the principal characters cited) can any sharp line be drawn between the two.

Very possibly this was known to Mr. Bicknell; for he, if I interpret him correctly,[2] believes that nomenclature and classification are quite independent of one another and that every form which can be distinguished at all should bear a binomial name and pass as a species. Those, however, who believe that nomenclature can and should be made to set forth in some degree the facts of nature will doubtless, in view of the inconstancy of its characters, treat *L. intercursum* rather as a northern geographic variety of *L. floridanum* than as a definitely separable species. As such, it should be called *Linum floridanum* (Planch.) Trel., var. **intercursum** (Bicknell), n. comb.

In addition to the stations given by Mr. Bicknell, the variety has been collected at several places on Cape Cod, in Rhode Island and in the sand-plain region of central Connecticut.— C. A. Weatherby, East Hartford, Conn.

[1] Bull. Torr. Bot. Club xxxix. 418.
[2] See Bull. Torr. Bot. Club xxxix. 427.

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Rhodora

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THE DOCTORS JOHN BRICKELL.

B. L. Robinson.

The writer has recently been working on a revision of *Brickellia*, a genus of eupatorioid *Compositae*, abundant in the western part of our country and in the warmer parts of America, although barely entering the region covered by Gray's Manual. During this task an attempt was made to learn something of the man for whom the group was named. In the original publication, its author, Stephen Elliott, in his Sketch of the Botany of South Carolina and Georgia, ii. 290 (1822?), says "I have named it in commemoration of Dr. John Brickell, of Savannah, who at one period of his life paid much attention to the botany of this country, and made known to Dr. Muhlenberg, Fraser and others, many of its undescribed plants."

With this excellent start, giving the full name, profession, place of residence, and correspondents of the person in question, it seemed likely that such further facts as the dates of his birth and death, the extent and nature of his publications, etc., could be readily ascertained. However, in the usual sources of such information, the material found was neither extensive nor consistent.

Wittstein in his Etymologisch-botanisches Handwörterbuch, 123 (1856) says: "**Brickellia** Ell. (*Compositae*). Nach John Brickell; schrieb: The nat. hist. of North Carolina, Dublin 1837."

Dr. Gray in the Synoptical Flora, i. pt. 2, 103 (1884) cautiously confines his statement regarding the dedication of the genus to the following words: "*Dr. John Brickell* of Georgia, correspondent of Muhlenberg and Elliott."

Britten & Boulger in their Biographical Index of British and Irish

Botanists, 22 (1893), give the following: "**Brickell, John** (fl. 1730–1745). M. D. 'Nat. Hist. N. Carolina,' Dublin, 1737. Cat. American plants and trees, Dublin, 1745. Sent plants to Muhlenberg. Elliott, Bot. Carolina, ii. 290. *Brickellia* Ell."

In the Catalogue of the Library of the Arnold Arboretum, i. 111 (1914), occurs the following:

Brickell, John. Jeffersonia [New York. 1800.]
Medical repository, 1800. i. 555.
——— The natural history of North-Carolina, with an account of the trade, manners, and customs of the Christian and Indian inhabitants. Dublin. 1737. sm. 8°. pp. [4], xvi, 408. Map and 4 plates.
"Of the vegetables of North Carolina," pp. 57–106.
——— Stellandria [and] Stellandria glabra. [New York. 1803.] 8°.
Medical repository, 1803, vi, 327.

The fact that must strike anyone who attentively examines these records is that they attribute to Dr. John Brickell an extraordinarily long period of activity. It is true the date 1837 given by Wittstein is merely a clerical or typographical error, for the Natural History of North Carolina by Brickell was published a hundred years earlier. It passed through several editions, or rather reprints, one in 1737, one, it is said, in 1739, another in 1743, and according to Watt in the Bibliotheca Britannica and to Allibone in his Critical Dictionary of English Literature, i. 244, the earliest in 1723. However, a man who could prepare for publication such a work even as early as 1737 (not to mention 1723 — a date open to suspicion of error) was certainly not likely to be writing for the Medical Repository in 1803. Nor would a man who, according to Britten & Boulger, flourished in 1730–45, be likely to have been a correspondent of Muhlenberg and Stephen Elliott, who "flourished" at least a generation later.

Suspecting that two men of the same name and profession, though of very different epochs, had been confused by the authors quoted, the writer made such search for precise records as time and opportunity permitted. It soon became clear that the Dr. John Brickell of Savannah in the time of Elliott was a physician and botanist of more than local reputation, who was among the original subscribers to the Medical Repository and who contributed to that journal the following articles:

1) A communication of three paragraphs, hexade 1, vol. i. 573 (1798), describing as a new genus, under the name of *Jeffersonia*, the yellow jasmine of the southern states, apparently without knowledge

of the earlier description of the same plant as *Gelsemium*. The article is prefaced by the editorial note: "*The following article is from a letter, just received, from Dr. Brickell, of Savannah, whose Botanical Communications we shall always be happy to admit.*"

2) Theory of Puerperal Fever. Hex. 1, ii. 15–17 (1799).

3) Botanical Intelligence from Dr. Brickell, of Savannah, in the State of Georgia, addressed to the Editors. Hex. 1, vi. 327–8 (1803). In this paper Brickell describes under the name *Stellandria Glabra* the plant which appeared during the same year in Michaux's Flora, ii. 219, as *Schisandra coccinea*. Brickell also mentions a new species of *Samolus*, and states that *Kuhnia* occurs with distinct anthers — an observation acute for the period. At one point in his article he refers to "my friend Mr. Stephen Elliott."

4) Effects of Alkalies on Poisons. Hex. 2, ii. 441–2 (1805).

5) Sketches relative to the Natural History of the Blood and a Theory of Gout, communicated by John Brickell, M. D. of Savannah, to Dr. Mitchill. Hex. 2, vi. 45 (1809).

Muhlenberg in his Catalogue, on page iv. of the preface (1813), gives a list of friends and correspondents who had assisted him by communicating specimens or seeds. Among these appears "Brickell, (John) M. D. from Georgia, deceased."

It therefore became clear that the Dr. John Brickell in question wrote articles from 1798 to 1809 and had died before 1813.

Records, perhaps wholly unconnected with our subject, were found showing that there was a student of the name John Brickell at Columbia College in 1774 and that a John Brickell was recommended for an appointment in the United States army in 1782.

From the facts here assembled it seemed clear that the Dr. John Brickell in question was of a later generation than the man of the same name who wrote in the first half of the 18th century the Natural History of North Carolina. However, no precise information being available as to the dates of birth or death or regarding possible relationship of these two men, the problem was turned over to Miss Mary A. Day, the experienced librarian of the Gray Herbarium. Dr. George E. Richards of Boston also very kindly made search at the Boston Medical Library. Finally, in reply to a letter of inquiry addressed by Miss Day to the Georgia Historical Society, an organization with headquarters in Savannah, the following highly satisfactory letter was received.

Savannah, Ga., 23d September, 1916.

Miss Mary A. Day, Librarian Gray Herbarium,
Cambridge, Mass.

Dear Miss Day:—

I take great pleasure in giving you the following information in reply to yours of the 20th concerning Dr. John Brickell, but regret that I cannot give more.

Dr. Brickell died in the year 1809, and the day after his death the following notice appeared in the only newspaper published here:

From *The Republican and Savannah Evening Ledger*, Saturday, Dec. 23, 1809.

"Died, on Friday evening, 22d instant, doctor JOHN BRICKELL, aged sixty years.

"Dr. Brickell was a native of the county of Lowth (Ireland) and had been forty years in America, thirty of which he spent in Georgia. He was an excellent classic scholar, an ingenious naturalist, and a sincere patriot, having evinced a fervent attachment to the honor and welfare of the United States. In a country peculiarly favorable to botanical researches, Dr. B. (as this was among his favorite studies) had distinguished himself by unwearied application, and the many communications he received from the learned of various climes proved him to have been successful in his pursuit.

"As a politician, he always ranked among the firmest and most incorruptible adherents to the whig administrations of this country, and often mourned the misfortunes of that one he had left; and will long be regretted as a friend to the rights and liberties of the world, as an elegant and accomplished scholar, and as an honest man."

Dr. Brickell left a will which I have read today. It is dated Dec. 5, 1809, and was probated Jan'y 2, 1810. It opens with the statement that he was "weak in body." It is a short paper, and by it he left the whole of his estate to his "brother (now with me) James Brickell." Among the papers filed with the will is a single sheet containing only these words: "The whole of the estate of Doctor John Brickell was left in the possession of his brother James Brickell who disposed of the whole, the lot to Mr. Archibald S. Bulloch, and the negroes to different persons. The furniture, &c., was sold at his instance at public auction by Minis & Henry"

Filed 21 May, 1811. (Signed) Rich. Leake.
(One of the Executors).

There is no other name in the will besides the brother James.
I am glad to give you the foregoing, but fear it will be of little use to you.

Very truly yours,

Wm. Harden,
Librarian.

Thus, thanks to the kind interest of Mr. Harden and his skill in searching out old records, the matter in hand can now be cleared up. It is evident that in nearly all references to the dedication of the genus *Brickellia* two men of identical name were confused, both being presumably from the east of Ireland, both belonging to the same profession, both having biological interests, and both being authors of papers relating to phases of natural history.

It is easy to infer that John Brickell of Georgia, the friend of Muhlenberg and Elliott, may have been the son or grandson of the earlier John Brickell of North Carolina, but no evidence on this matter has come to hand.

It may be mentioned that even before Elliott dedicated his genus *Brickellia* to his friend Brickell, Rafinesque had used the name *Brickellia* in one of those hurried, careless, and in no way justified changes of name so frequent in his works. Thus in the Medical Repository, hex. 2, ii. 352–3 (1808) Rafinesque characteristically writes "Having found in the Flora Boreali-Americana of Michaux, many new genusses, which had already been published under other names by different authors, or to which unappropriate names were given against the usual botanical rules, I shall rectify those errors; in the former case annulling Michaux's names and adopting the former ones, such as * * *

While, in the latter I shall create new names more appropriated, and I shall call * * *

Brickellia, the sponcopsis of do. [Michaux]."

By *sponcopsis* [1] it has been generally inferred that Rafinesque meant *Ipomopsis*, a name employed by Michaux for the plant now called *Gilia rubra* (L.) Heller. Rafinesque clearly had no right to change the name used by Michaux and his *Brickellia* has no validity under any code, even in the unlikely contingency that this particular section of *Gilia* should regain generic standing. Our interest in the matter at present lies solely in the circumstance that it was an attempt to give recognition to the same Dr. John Brickell for whom Elliott later named the now well known genus *Brickellia* of the *Compositae*. It is true, Rafinesque made no explanation of his *Brickellia*, but that very fact would indicate that it was given in honor of a man then prominent, and it is to be noticed that it was published in the Medical Repository, a journal to which Brickell was at that period a not infrequent contributor, a fact which probably led Rafinesque to assume that explanation as to his identity would have been superfluous.

Regarding the earlier Dr. John Brickell little is known. His Natural History of North Carolina, now a work of rarity, prized by collectors of early Americana, was drawn largely, though without acknowledgement, from an earlier History of Carolina, by John

[1] This misprinted name has received still further distortion by Reichenbach, who in his Conspectus Regni Vegetabilis 212° (1828) cites it as *Spogopsis*, a spelling which is copied by Pfeiffer in his usually very accurate Nomenclator, i. 467 (1873).

Lawson (London, 1709, 1714, 1718), and has been variously estimated. Thus, Jared Sparks (North American Review, xxiii. 288, Oct., 1826) remarks concerning it "a more daring piece of plagiarism was never executed," while J. Bryan Grimes, in a prefatory note accompanying a facsimile reprint issued by authority of the Trustees of the [North Carolina] Public Libraries in 1911, calls attention to the fact that although largely based upon the earlier work of Lawson, Brickell's Natural History is expanded to nearly twice the length and contains, especially on the medical side, much original matter.

According to Grimes, in the prefatory note above mentioned, Dr. John Brickell and his brother the Rev. Matthias Brickell came to Carolina with Gov. Burrington. John settled at Edenton. He was on the grand jury of the whole province in 1731, and, being appointed about that time a member of a mission to the Cherokee Indians, took part in an expedition to the interior which is thought to have penetrated well into what is now Tennessee. Soon after this journey he returned to England and his subsequent life is wholly unknown. Besides his Natural History he wrote a Catalogue of American Trees and Plants which will bear the Climate of England. According to Allibone (l. c.) this was a folio published in London in 1739. However, Britten & Boulger give the place of publication as Dublin and the date as 1745, which would indicate that this work also passed through more than one edition.

To differentiate, by way of summary, the two men who have been so generally confused, they were as follows:

1) An earlier Dr. John Brickell, who settled at Edenton, North Carolina, in the earlier half of the 18th century, author of a somewhat grotesque and largely compiled Natural History of North Carolina, published (according to Allibone) in 1723, with better known editions in 1737, 1739, and 1743; also a Catalogue of American Trees and Plants which will bear the Climate of England, published in London, 1739, and in Dublin, 1745.

2) A later Dr. John Brickell, born in County Louth, Ireland, in or about 1749, for thirty years resident in Savannah, Georgia, where he died 22 December, 1809, an acute observer of the local vegetation, a man highly respected, author of several medical and botanical communications to the then prominent Medical Repository of New York, a friend of Muhlenberg, Fraser, and of Elliott, who dedicated to him the composite genus *Brickellia*.

Gray Herbarium.

NOTES ON GRAMINEAE, —I.

F. Tracy Hubbard.

In the past two years' study certain necessary changes in the nomenclature of the Gramineae of the seventh edition of Gray's Manual have been noted and furthermore in collections which have been examined certain additions to the Manual have appeared. With a view to calling these facts to the attention of the Manual users this paper has been prepared.

Holcus halepensis L. Sp. Pl. **2**: 1047 (1753). *Sorghum halepense* (L.) Pers. Syn. **1**: 101 (1805); Hitchc. in Gray Man. ed. 7, 95 (1908). *Andropogon halepensis* (L.) Brot. Fl. Lusit. **1**: 89 (1806).— As pointed out by Hitchcock in Jepson Fl. Calif. 126 (1912) *Holcus* L. should be used for the species which recent authors have called Sorghum rather than those for which they have retained the name. While not accepting the type-species reason as a basis for this change, I have reached the same conclusion by studying the description of Holcus as given by Linnaeus Gen. Pl. ed. 5 469 (1754) which I believe applies to *H. Sorghum* and its allies and really excludes *H. lanatus* and its allies. This conclusion is strengthened by Linnaeus's generic synonym, *Sorghum*, Mich.

Digitaria Ischaemum Schreb. ex Muhl. Descr. Gram. 131 (1817). *Panicum lineare* Krock. Fl. Siles. **1**: 95 (1787) non L. *P. Ischaemum* Schreb. ex Schweigg. Spec. Fl. Erlang. 16 (1804). *D. humifusa* Pers. Syn. **1**: 85 (1805); Hitchc. in Gray Man. ed. 7, 95 (1908). *P. glabrum* Gaud. Agrost. Helv. **1**: 22 (1811). *D. glabra* (Gaud.) Beauv. Agrost. 51, 169 (1812). *D. linearis* (Krock.) Rostaf. in Verh. Zool.-Bot. Ges. Wien. **22**: 99 (1872) non Pers. *Syntherisma linearis* (Krock.) Nash in Bull. Torr. Bot. Cl. **22**: 420 (1895). *S. humifusum* (Pers.) Rydb. in Mem. N. Y. Bot. Gard. **1**: 469 (1900). *S. Ischaemum* (Schreb.) Nash in No. Am. Fl. **17**: 151 (1912).

Although there is no specimen of *D. Ischaemum* in the Muhlenberg herbarium [according to the list of grasses given by Scribner and Merrill in Circ. U. S. Div. Agrost. **27** (1900)] there seems little question of the identity of his species. In the first place Muhlenberg cites Schreber as the authority of his plant and Schreber was a friend of his so that he was probably in correspondence with him and probably *D. Ischaemum* is based on *Panicum Ischaemum* which is unquestionably the same as *D. humifusa*. Moreover although, in most respects, Muhlenberg's description is broad enough to apply to both *D. sanguinalis* and *D. humifusa*, "nodis glabris" and "Vaginis striatis glabris purpurascentibus" certainly answer to the latter and not to the former.

Furthermore Muhlenberg, in the same work, has descriptions of both *D. sanguinalis* and *D. filiformis*, the only other species which his description could apply to, so that all told it seems probable that he was describing the plant we have known as *D. humifusa*. Consequently I am accepting Schreber ex Muhlenberg as the authority for *D. Ischaemum* which is without question the correct specific combination for the plant recently treated as *D. humifusa*.

Echinochloa crusgalli (L.) Beauv. forma **vittata** forma nov.— Differt a typo foliis inter nervos virides flavo-viridibus. New Brunswick: Shediac Cape, August 19, 1916, house yard, *F. Tracy Hubbard*, no. 763 (type, in Herb. Hubb.). Massachusetts: Stoughton, September 15, 1912, waste ground, in yard, *S. F. Blake*, no. 4639.

This plant is at once noticeable on account of its almost golden leaves veined with rather dark green. Otherwise it seems to show no variation from the type.

Setaria **lutescens** (Weigel) comb. nov. *Panicum glaucum* Auct. non L. *P. lutescens* Weigel Obs. 20 (1772). *S. glauca* Auct. as to plant. *Chaetochloa lutescens* (Weigel) Stuntz in U. S. Bur. Pl. Ind. Inv. Seeds & Pl. Imp. **31**: 36, 86 (1914).— As pointed out by Stuntz in the above mentioned article *Panicum glaucum* L. should be applied to the pearl millet which has been called *Pennisetum americanum* (L.) K. Schum., but now becomes *Penn. glaucum* (L.) R. Br. The oldest available name for the plant known as *S. glaucum* is *Panicum lutescens* Weigel, consequently the correct name of our plant is *S. lutescens*. *S. glauca* (L.) Beauv. and *Chaetochloa glauca* (L.) Scribn. are typonyms of Pennisetum glaucum.

Setaria viridis (L.) Beauv. var. Weinmannii (R. & S.) Brand in Koch Syn. Deutsch. Fl. ed. 3, **3**: 2690 (1905); Fernald & Wiegand in Rhodora **12**: 133 (1910). *S. viridis* var. *breviseta* (Doell.) Hitchc. in Rhodora **8**: 210 (1906); Hitchc. in Gray Man. ed. 7, 119 (1908).— As pointed out in Am. Journ. Bot. **2**: 181 (1915) it seems undesirable to separate var. *breviseta* from var. *Weinmannii* and as the latter is the earliest varietal name which we can apply with certainty to this form it replaces var. *breviseta*.

Setaria italica (L.) Beauv. [sensu amplissimo] Agrost. 51, 170, 178 (1812).— This species is most readily distinguished from *S. viridis* by the fact that the spikelet in the latter is articulate below the glooms; the complete spikelet shelling out leaving a cup-like receptacle whereas *S. italica* has the spikelet articulate above the glooms; the fruit only shelling out leaving the glumes and sterile lemma behind. For a complete treatment of *S. italica* and variations see Am. Journ. Bot. **2**: 183–196 (1915) of which variations the following have so far been noted within the Manual range: subsp. stramineofructa Hubb.[1] and its forma breviseta (Doell) Hubb. [Golden Wonder Millet, treated in the Manual as var. *germanica*]; subsp. stramineofructa

[1] These combinations were all made in Am. Journ. Bot. **2**: 183–196 (1915).

subvar. GERMANICA (Mill.) Hubb. with its forma MITIS (Alef.) Hubb.; subsp. STRAMINEOFRUCTA var. HOSTII Hubb. and its subvar. METZGERI (Körnicke) Hubb. and subsp. STRAMINEOFRUCTA var. BRUNNEOSETA subvar. DENSIOR Hubb.

ORYZOPSIS CANADENSIS (Poir.) Torr. ex Gray Man. 583 (1848) as to name bringing synonym not as to plant.[1] *Stipa canadensis* Poir. in Lam. Encycl. **7**: 452 (1806); Hitchc. in Gray Man. ed. 7, 123 (1908) — Some time ago Prof. Hitchcock pointed out to me that *Stipa canadensis* was in reality an *Oryzopsis*.

MUHLENBERGIA SQUARROSA (Trin.) Rydb. in Bull. Torr. Bot. Cl. **36**: 531 (1909). *Vilfa squarrosa* Trin. in Mem. Acad. St. Petersb. Ser. 4, Sci. Nat. **5**[2]: 100 [separate 73] (1840). *V. Richardsonis* Trin. l. c. Ser. 4, Sci. Nat. **5**[2]: 103 [separate 81] (1840). *V. depauperata* Torr. ex Hook. Fl. Bor. Am. **2**: 257 (1840) not *M. depauperata* Scribn. in Bot. Gaz. **9**: 187 (1884). *M. aspericaulis* Nees ex Steud. Nom. ed. 2, **2**: 164 (1840) nomen. *Sporobolus depauperatus* (Torr.) Scribn. in Bull. Torr. Bot. Cl. **10**: 63 (1883). *S. Richardsonis* (Richardsonii) (Trin.) Merr. in RHODORA **4**: 46 (1902); Hitchc. in Gray Man. ed. 7, 130 (1908). *M. Richardsonis* (Trin.) Rydb. in Bull. Torr. Bot. Cl. **32**: 600 (1905).

Careful study of the genera *Sporobolus*, *Muhlenbergia* and *Epicampes* has led me to agree with the conclusion of Rydberg and others that the whole of the group of *Sporobolus* to which *S. Richardsonis* and *S. brevifolius* belong is more correctly placed in *Muhlenbergia* than in *Sporobolus*. Furthermore I can find no specific differences between *M. squarrosa* and *M. Richardsonis* and as *Vilfa squarrosa* has priority of place in Trinius's paper I take squarrosa as the name of the collective species that the same name may be used under both codes.

MUHLENBERGIA CUSPIDATA (Torr.) Rydb. in Bull. Torr. Bot. Cl. **32**: 599 (1905). *Agrostis brevifolia* Nutt. Gen. No. Am. Pl. **1**: 44 (1818) not *M. brevifolia* Scribn. ex Beal Grasses No. Am. **2**: 254 (1896). *Sporobolus cuspidatus* (cuspidata) (Torr.) Wood Sedges & Grasses Atlant. Div. U. S. 385 (1871); Scribn. in Bull. Torr. Bot. Cl. **10**: 63 (1883). *S. brevifolius* (Nutt.) Scribn. in Mem. Torr. Bot. Cl. **5**: 39 (1894); Hitchc. in Gray Man. ed. 7, 130 (1908).

As there is a valid *M. brevifolia* Scribn. ex Beal *S. brevifolius* when transferred to *Muhlenbergia* must become *M. cuspidata*.

GINANNIA Bub. Fl. Pyr. **4**: 321 (1901) non Scop. nec F. G. Dietr. nec Montagne nec M. Roem. *Holcus* Auct. non L. *Homalachna* (Benth. & Hook. f.) Post & Ktze. Lex. Gen. Phan. 285 (1903) in part. *Notholcus* Nash ex Hitchc. in Jepson Fl. Calif. 126 (1912).— As stated above *Holcus* is reapplied to the Sorghum group leaving the *Holcus* of authors in need of a name. The oldest generic name, aside from Holcus is *Ginannia* Bub. which according to the American Code is inadmissible

[1] The plant treated is *O. pungens* (Torr.) Hitch.

as there are four older uses of the name. However as all four are reduced to synonymy this allows *Ginannia* Bub. to be retained according to the International Rules — *Ginannia* Scop. Introd. 300 (1777) equals *Palovea* ("Palone") Aubl. Hist. Pl. Guiane **1**: 365 (1775). *Ginannia* F. G. Dietr. Vollst. Lex. Gaetrn. **4**: 357 (1800) equals *Gilibertia* Ruiz & Pav. Fl. Peruv. et Chil. Prodr. 50 (1794). *Ginnania* Montagne in Webb & Berth. Phytogr. Canad. **4**: 162 in adnot. (1840) a genus of Algae is a synonym of *Scinaia* Biv. Scinaia (1822). *Ginnania* M. Roem. Synops Monogr. **1**: 79, 90 (1846) is a synonym of *Turraea* L. Mant. Alt. 150 (1771).

Ginannia **lanata** (L.) comb. nov. *Holcus lanatus* L. Sp. Pl. **2**: 1048 (1753). *G. pubescens* Bub. l. c. 321 (1901). *Notholcus lanatus* (L.) Nash ex Hitchc. in Jepson l. c. 126 (1912).

Sphenopholis pennysylvanica (L.) Hitchc. in Am. Journ. Bot. **2**: 304 (1915). *Avena pennsylvanica* L. Sp. Pl. **1**: 79 (1753). *A. palustris* Michx. Fl. Bor. Am. **1**: 72 (1803). *Trisetum pennsylvanicum* (L.). Beauv. Agrost 154 (index) (1812) [the comb. is not made]; ex R. & S. Syst. **2**: 658 (1817). *T. palustris* (Michx.) Torr. Fl. No. & Mid. U. S. **1**: 126 (1824). *T. ludovicianum* Vasey in Bull. Torr. Bot. Cl. **12**: 6 (1885). *S. palustris* (Michx.) Scribn. in Rhodora **8**: 145 (1906); Hitchc. in Gray Man. ed. 7, 139 (1908.) — As pointed out by Hitchcock in Am. Journ. Bot. **2**: 304 (1915) the specimen of Avena pennsylvanica in the Linnean Herbarium is identical with the species that has been called *S. palustris* and consequently as the older specific name must replace palustris.

Var. **flexuosa** (Scribn.) comb. nov. *S. palustris* var. *flexuosa* Scribn. in Rhodora **8**: 145 (1906); Hitchc. in Gray Man. ed. 7, 139 (1908).— As the specific combination has been altered a new combination is required in transferring the variety.

Arrhenatherum elatius (L.) Beauv. var. **nodosum** (Reichb.) comb nov. *Gramen bulbosum nodosum* Lobel Icon. Stirp. Pl. 23 (1591). *Gramen nodosum, avenacea panicula* C. Bauhin Pinax 2 (1623); C. Bauhin Theatr. Bot. 18, fig. (1658); Scheuchzer Agrost. 237, t. 4, f. 27 & 28 (1719). *Gramen avenaceum gemmea radice seu nodosa minor* Morison Hist. **3**, Sect. 8, p. 214, t. 7, f. 38 (1715). *Avena panicula nutante, calycibus bifloris, altero floseulo aristato* Royen Fl. Lœyd. Prodr. 66 (1740). *Avena elatior* β. L. Sp. Pl. **1**: 79 (1753). *Avena tuberosa* Gilib. Exercit. **2**: 538 (1792). *Av. precatoria* Thuill. Fl. Par. ed. 2, 58 (1799). *Av. bulbosa* Willd. in Ges. Naturf. Fr. Berl. Neue Schr. **2**: 116 (1799). *Holcus bulbosus* (Willd.) Schrad. Fl. Germ. **1**: 248 (1806). *Arrhen. precatorium* (Thuill.) Beauv. Agrost. 56, 152, 154 (1812). *Arrhen. bulbosum* (Willd.) Presl Cyp. & Gram. Sic. 29 (1820). *Arrhen. avenaceum* var. β *nodosum* Reichb. Icon. Bot. Pl. Crit. Cent. **11**: [Agrost. Germ.] 45, t. 104, f. 1717 (1834); Reichb. Icon. Fl. Germ. et Helv. **1**: [Agrost. Germ. ed. 2] 19, t. 104, f. 1717 (1850). *Arrhen avenaceum* * *nodosum* Kirschl. Prodr. Fl. Alsac. 210 (1836). *Av. elatior* b. *nodosa* (Reichb.) Mutel Fl. Fr. **4**: 65 (1837). *Arrhen.*

elatius β *bulbosum* (Willd.) Koch Syn. Fl. Germ. et. Helv. 793 (1837). *Holcus avenaceus* var. β. *nodosus* (Reichb.) Vis. Fl. Dalmat. **1**: 47 (1842). *Arrhen. nodosum* (Reichb.) Kirschl. Fl. Alsac. **2**: 313 (1857). *Av. elatior* d) *tuberosa* (Gilib.) Aschers. Fl. Prov. Brandenb. **1**: 826 (1864), *Av. elatior* B. *tuberosa* (Gilib.) Aschers. & Graebn. Syn. Mitteleur. Fl. **2**[1]: 231 (1899). *Arrhen. elatius* β *tuberosum* (Gilib.) Halácsy Consp. Fl. Graec. **3**: 375 (1904).

Readily distinguished from the type by the nodulose corms at the base of the culm. This plant was mentioned in Rhodora **13**: 9 & 207, t. 85 (1911) and specimens of it were mentioned from Virginia. Massachusetts: Plymouth, June 22, 1912, dump, *S. F. Blake*, no. 3854. The earliest varietal name is nodosum and this should replace the current tuberosum.

Forma **striatum** nom nov. *Arrhen bulbosum variegatum* Hort. cf. Hitchc. in Bail. Stand. Cycl. Hort. **1**: 397 (1914).— Differt a typo varietatis foliis albo-striatis. Massachusetts: Plymouth, June 22, 1912, dump, *S. F. Blake*, no. 3855.— This form is quite clearly separated from the normal form of the variety by the white-striated leaves.

Eragrostis cilianensis (All.) Link ex Viguolo-Lutati in Malpighia **18**: 386 (1904). *Briza Eragrostis* L. Sp. Pl. **1**: 70 (1753). *Poa multiflora* Forsk. Fl. Aegypt.-Arab. 21 (1775) non *E. multiflora* (Roxb.) Trin. in Mem. Acad. St. Petersb. **6**[1]: 401 (1830). *P. cilianensis* All. Fl. Pedem. **2**: 246, t. 91, f. 2 (1785). *P. Eragrostis* Cav. Icon. **1**: 63, t. 92 (1791) non L. *B. oblonga* Moench Meth. 185 (1794). *P. megastachya* Koel. Gram. 181 (1802). *E. major* Host Gram. Austr. **4**: 14, t. 24 (1809). *E. megastachya* (Koel.) Link Hort. Berol. **1**: 187 (1821); Hitchc. in Gray May. ed. 7, 150 (1908).— As pointed out in Philipp. Journ. Sci. Bot. **8**: 159 (1913) the oldest valid name for the species called *Eragrostris megastachya* is *E. cilianensis*.

Poa palustris L. Syst. Nat. ed. 10, **2**: 874 (1759); Roth. Tent. Fl. Germ. **1**: 43 (1788); **2**[1]: 117 (1789). *P. serotina* Ehrh. Beitr. **6**: 83 (1791) nomen. *P. triflora* Gilib. Exercit. **2**: 531 (1792); Hitchc. in Gray Man. ed. 7, 156 (1908). *P. riparia* Wolff in Hoffm. Deutschl. Fl. **1**: 42 (1800). *P. fertilis* Host Gram. Austr. **3**: 10, t. 14 (1805). *P. hydrophila* Pers. Syn. **1**: 89 (1805). *P. effusa* Kit. in Schult. Oesterr. Fl. ed. 2, **1**: 227 (1814). *P. angustifolia* Wahlenb. Fl. Ups. 34 (1820) non L. *P. adspersa* Drejer Fl. Excurs. Hafn. 35 (1838).— As pointed out by Ascherson and Graebner Syn. Mitteleur. Fl. **2**[1]: 416 (1900) *Poa palustris* L. is unquestionably the same as the plant called *P. triflora* in spite of Linnaeus's false synonymy. This view is strengthened by the fact that the plant was well characterized under the Linnean name by Roth Tent. Fl. Germ. **2**[1]: 117 (1789) which antedates all other names applied to the species. This name is accepted by the more recent European botanists.

Festuca capillata Lam. Fl. Fr. **3**: 597 (1778). *F. tenuifolia* Sibth. Fl. Oxon. 44 (1794). *F. paludosa* Gaud. Agrost. Helv. **1**: 229 (1811). *Poa capillata* (Lam.) Merat Nouv. Fl. Env. Par. 38 (1812). *F. mutica*

Wulf. Fl. Norica Phan. ed. Fenzl & Graf. 145 (1858). *F. ovina* subsp. *eu-ovina* var. *capillata* (Lam.) Hack. Monogr. Fest. 85 (1882); Hitchc. in Gray Man. ed. 7, 162 (1908).— Field and herbarium study convince me that this is a clearly defined species rather than a variety of *F. ovina*. The principal characters which distinguish it from *F. ovina* are the capillary, usually longer and flexuous leaves, the smaller spikelets with awnless lemmas and the later date of flowering; in some cases as much as two weeks later than that of *F. ovina*.

Cambridge, Massachusetts.

SOME ALLIES OF ANTENNARIA ALPINA FROM NEWFOUNDLAND AND THE LABRADOR PENINSULA.

M. L. Fernald.

Antennaria **cana** (Fernald & Wiegand), n. comb. *A. alpina*, var. *cana* Fernald & Wiegand, Rhodora xiii. 24 (1911), in part. Planta humifusa, stolonibus foliosis confertis perbrevibus (ad 2 cm. longis); foliis basilaribus anguste cuneato-obovatis vel late oblanceolatis obtusis nec mucronatis basi latis 3–11 mm. longis 2–5 mm. latis supra albidis, tomento denso minuto; caule florifero 2.5–12 cm. alto gracile; foliis caulinis 9–15 subapproximatis linearibus, imis 8–15 mm. longis 1–2 mm. latis apice subulato, superioribus 5–8 mm. longis 0.5–1 mm. latis apice scarioso lanceolato; capitulis femineis (1–) 2–6 campanulatis corymbosis, pedicellis ad 1 cm. longis: involucro 5–7 mm. alto basi lanato; bracteis 3-seriatis subaequalibus tenuissimis, exterioribus oblongis obtusis brunneis, interioribus lanceolatis fulvis leviter fimbriatis; foveis receptaculi maturi denudati 60–100 0.1 mm. latis quam jugis separantibus acutis multo latioribus.

Humifuse, the crowded leafy stolons very short (up to 2 cm. long): rosette-leaves narrowly cuneate-obovate or broadly oblanceolate, obtuse, not mucronate, broad-based, 3–11 mm. long, 2–5 mm. broad, white above with dense minute tomentum: flowering stem 2.5–12 dm. high, slender: cauline leaves 9–15, rather crowded, linear, the lower 8–15 mm. long, 1–2 mm. broad, subulate-tipped; the upper 5–8 mm. long, 0.5–1 mm. wide, with a lanceolate scarious tip: pistillate heads (1–) 2–6, campanulate, corymbose, on pedicels up to 1 cm. long: involucre 5–7 mm. high, lanate at base: bracts 3-seriate, subequal, very thin, the outer oblong, brown; the inner lanceolate, tawny, slightly fimbriate: pits of the mature denuded receptacle 60–100,

0.1 mm. broad, much broader than the acute intermediate ridges.—NEWFOUNDLAND: limestone barrens near sea-level, Pointe Riche, August 4, 1910, *Fernald & Wiegand*, no. 4,139 (TYPE of *A. alpina*, var. *cana*, in Gray Herb.); dry limestone barrens, upper slopes and tablelands, altitude 200–300 m., Table Mountain, Port à Port Bay, August 16, 1910, *Fernald & Wiegand*, no. 4,141, July 16 & 17, 1914, *Fernald & St. John* in *Plantae Exsiccatae Grayanae*.

When *A. alpina*, var. *cana* was published no clear characters were recognized by which to distinguish it specifically from *A. alpina* (L.) Gaertn. and specimens with canescent foliage were cited from Norway, Greenland, Labrador and Newfoundland. The recent collection of material, consisting of several hundred individuals, brought back from Table Mountain by Mr. St. John and the writer is so consistent in its characters and so different in some important points from *A. alpina* that a more detailed study of the group has been undertaken. *A. alpina* of northern Europe and Greenland and its var. *canescens* Lange, Fl. Dan. xvi. (fasc. xlvii), 9, t. 2786 (1869) — overlooked when var. *cana* was published — have the oblanceolate rosette-leaves terminated by a distinct short mucro, but in all the Newfoundland material the shorter more cuneate-obovate leaves are blunt. In *A. alpina* and var. *canescens* the denuded mature receptacle exhibits only 20–30 large pits 0.3–0.4 mm. broad, but in the Newfoundland plant, *A. cana*, the pits are very numerous (60–100) and much smaller, about 0.1 mm. broad. In *A. alpina* the cauline leaves are larger, the lower often 2 cm. long by 3 mm. wide, and commonly fewer (4–9). It seems wiser, therefore, to treat the plant of the Newfoundland limestones as a distinct species.

The specimens from Norway and Greenland, and two of those from Labrador originally cited under *A. alpina*, var. *cana* belong, apparently, to *A. alpina*, var. *canescens* Lange. But one of the Labrador plants so far departs from *A. alpina*, on the one hand, and *A. cana*, on the other, as to seem specifically separate from both. In this plant, collected by Mr. Sornborger at Rama, the rosette-leaves are like those of *A. alpina*, var. *canescens*, but the flowering stems, instead of being flexuous as in *A. alpina* and in *A. cana*, are stiffly erect, with crowded leaves; and the receptacle of the Rama plant resembles that of *A. cana* in its numerous tiny pits, but the intermediate ridges, instead of being acute, are rounded and as broad as the pits. This plant seems heretofore to have been unrecognized and it may be called

ANTENNARIA **Sornborgeri**. Planta humifusa ramis prostratis subligneis 1 dm. longis, stolonibus confertis perbrevibus; foliis basilaribus

oblanceolatis 6–12 mm. longis 1.5–2 mm. latis ad apicem angustatis breviter mucronatis canescento-pannosis; caule florifero rigido erecto 0.4–11 dm. alto; foliis caulinis 9–12 approximatis linearibus 5–15 mm. longis 0.5–1.5 mm. latis, superioribus cum apice scarioso lanceolato villoso munitis; capitulis femineis 1–3 sessilibus campanulatis; involucro 6–7 mm. alto basi lanato; bracteis 3-seriatis subaequalibus, exterioribus lanceolatis brunneis, interioribus lineari-attenuatis fulvis, eroso-serrulatis; foveis receptaculi denudati 60–100 0.1 mm. latis juga obtusa separantia latitudine subaequantibus.

Humifuse, with trailing subligneous branches 1 dm. long: stolons very short and crowded: rosette-leaves oblanceolate, 6–12 mm. long, 1.5–2 mm. wide, narrowed at summit to the short-mucronate tip, canescent-pannose: flowering stem stiffly erect, 0.4–1.1 dm. high: cauline leaves rather crowded, 9–12, linear, 5–15 mm. long, 0.5–1.5 mm. wide; the upper with villous lanceolate scarious tips: pistillate heads 1–3, sessile, campanulate: involucre 6–7 mm. high, lanate at base: bracts about 3-seriate, unequal; the outer lanceolate, brown; the inner linear-attenuate, yellowish-brown, erose-serrulate: pits of the denuded receptacle 60–100, 0.1 mm. broad, about as wide as the blunt-edged intermediate ridges.— Labrador: Rama, August 20–24, 1897, *J. D. Sornborger*, no. 156 (type in Gray Herb.).

Antennaria alpina (L.) Gaertn., var. **ungavensis**, n. var., a forma typica recedit caulibus floriferis elongatis 2–2.3 dm. altis; foliis caulinis 9–13; capitulis 1–2, inferiore pedicello 1–1.5 cm. longo.— Ungava: Stillwater River, August 12, 1896, *Spreadborough*, Geol. Surv. Can. no. 44,442 (type in Gray Herb.).

The material was distributed as *A. labradorica* Nutt. but it seems highly improbable that it is that problematical species. In all its technical points, glabrous oblanceolate mucronate rosette-leaves, the oblong glabrous appendages of the upper cauline leaves, the involucre, and the pits of the receptacle, in no way departing from typical *A. alpina* as understood by the writer, but noteworthy for its very tall stature, numerous cauline leaves, and the long-pediceled lower head of the 2-headed inflorescence.

Gray Herbarium.

SOME VARIETIES AND FORMS OF CONNECTICUT PLANTS.

E. H. Eames.

Leersia oryzoides (L.) Sw., forma **clandestina**, n. f., paniculis et terminalibus et lateralibus intra vaginas omnino inclusis; ceteris formae typicae similis.

Terminal as well as lateral panicles wholly included in the sheaths; otherwise like the typical form of the species.— Flooded margin of a peat-bog, Stratford, Connecticut, 6 October, 1901, *E. H. Eames*, no. 600.

Usually very slender, simple, attaining a length of about 1 m. This form was the only representative of the species at this station, where it was plentiful.

Spiranthes **Beckii** × **gracilis**, n. hyb. Lip very white with its throat tinted pale greenish yellow and, like other floral parts, intermediate in size between those of the parent-species. Roots commonly two, whiter than those of gracilis and more like those of Beckii in shape.— Found plentiful with the parent-species in a field at Bridgeport, Connecticut, 18 August, 1895, by *I. F. Moore*. No. 1362 in herbarium of E. H. Eames. Readily recognizable in life.

Sium cicutaefolium Schrank, var. **Carsonii** (Durand), n. comb. (*S. Carsonii* Durand, A. Gray, Man. ed. 5, 196. 1867).

This plant is so readily recognizable as a rule, that it should bear a name in keeping with its very apparent affinities. In the southwestern part of Connecticut it is not rare, being, in fact, sometimes sufficiently abundant to choke small streams.

Sambucus racemosa L., forma **chrysocarpa** Eames & Godfrey, n. f., drupis flavis.

Fruit yellow.— Rocky slopes of Quonnipaug Mountain, Guilford, Connecticut, 4 July, 1914, *E. H. Eames & C. C. Godfrey*, no. 8795. Fruiting freely, the ample panicles presenting a rich color effect.

Coreopsis pubescens Ell., var. **robusta** Gray in herb., caule ramisque glabris vel glabratis, foliis glabris primariis 8–12 cm. longis 2–4.5 cm. latis.

Stem and branches glabrous or glabrate; leaves glabrous, the primary 8–12 cm. long, 2–4.5 cm. wide.— Mountains of Virginia, Kentucky and North Carolina; adventive in Connecticut. Virginia: July, 1841, *Gray & Carey*. Kentucky: river-bank, Cumberland Falls, Whitley County, August 23, 1883, *J. Donnell Smith*. North Carolina: North Branch of New River, July, 1841, *Gray & Carey* (type in Gray Herb.); slopes of Cedar Cliff Mountain, Bun-

combe County, August 2, 1897, *Biltmore Herb.* no. 307[c]. Connecticut: waste grounds, Bridgeport, July 21, 1914, *E. H. Eames*, no. 8825.

Bridgeport, Connecticut.

Montia sibirica in Massachusetts.— While at Manchester, Massachusetts, in July, 1916, I noticed close to the verandah of the house where I was stopping a plant which I had never seen before. Not being able to trace it in Gray's Manual, I sent specimens to Prof. B. L. Robinson who informed me that it was *Montia sibirica* (L.) Howell, a Pacific Coast species not known on our eastern coast. A brief note on its occurrence here may be of interest.

There were fifty or more plants growing on soil kept damp by the drippings from the roof of the verandah. They were associated with *Stellaria media* and *Ranunculus repens* under a group of *Berberis vulgaris* round which twined *Smilax herbacea*. At first sight the plant reminded me of some of the *Caryophyllaceae* but it was marked by the cauline leaves of which there was a single pair on each stem, sessile, broadly cordate at the base and somewhat acute at the apex while the radical leaves, usually only one, were long-petioled and narrowly lanceolate.

The locality, Smith's Point, near Lobster Cove, Manchester, is a region covered by the estates of summer residents noted for their large and beautiful gardens. Since plants from the Pacific Coast are grown in large quantities it is probable that Montia was introduced with them directly or since, as Prof. Robinson informs me, the species has been introduced in certain localities in Europe, it may have reached our coast from the East. In the case of fungi it is not infrequently the fact that Pacific species reach our eastern coast by way of Europe. The hollyhock fungi is a well known instance.— W. G. Farlow, Cambridge, Massachusetts.

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Rhodora

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PINUS BANKSIANA ON NANTUCKET.

Eugene P. Bicknell.

In the interest of geographic botany a further word should be said in the matter of *Pinus Banksiana* on Nantucket as reported by Professor Harshberger in Rhodora, **16**: 184. The identity of the trees is not at all in question. The record rests on unquestioned authority, and I myself, a number of years ago, observed their little group in thriving growth at the locality described by Professor Harshberger. What has been their history there? For two reasons it would be a very notable thing were the Labrador pine by native right a member of the Nantucket flora. It would be very notable because of the wide severance from its present well defined natural range by which a remote northern tree had a place in the vegetation of Massachusetts and of southern New England; and it would be scarcely less a matter of botanical interest in its contradiction of a pronouncement of local history that Nantucket was originally a pineless island - originally, for it has never been questioned that the pitch pines, now so conspicuous a feature of the island's vegetation are not of native Nantucket ancestry. Mrs. Owen, writing in 1888, does not hesitate to say "The pines are all from seed planted by Joseph Sturgis and others in 1847 and following years."

The Labrador pines grow in a part of the island long ago explored by botanists, and close to the old Wauwinet road. It would be against the presumption that they had always grown there that so conspicuous a tree as a conifer, and so remarkable a thing as a colony of pine trees on Nantucket in the days before any pines were known to grow there, had failed of discovery by those earlier investigators.

It may be presumed that Doctor Harshberger, when he made his discovery, was limited to only a very hasty survey of the surroundings. His experienced eye in matters of plant association could not otherwise have failed to note in nearby community with the Labrador pines other conifers even more widely divorced from their natural habitats. *Pinus sylvestris* of northern Europe is there, and *Pinus massoniana* of China, growing among the native thickets, and with them are examples of our northern *Picea canadensis*, and the Rocky Mountain *Picea pungens*, besides, I am quite sure, other evergreens not now clearly recalled, as well as several kinds of exotic deciduous trees, all of which, including the Labrador pines have long been listed in nurseryman's catalogues. The largest of the Labrador pines are quite obviously of no greater age than their associates from other climes, and their group, which includes some smaller trees that must have sprung up naturally from seed, is doubtless of contemporary origin with a conspicuous and now well-matured and too closely grown planting of ornamental evergreens that tell their own tale. And their story may be amplified. A life long resident of the island gave me the information that, many years before, someone, whose name I had then no care to note, having an interest in that part of the island and in trees as well, planted there a large number of different kinds of trees, especially evergreens. My informant had it that a hundred different kinds had been set out there, although I saw no evidence of any quite so ambitious an attempt at arboriculture. I recall that some of these trees were being sacrificed to the construction of a tennis court which, as laid out, would separate the Labrador pines from the group of larger species, thus giving them a sort of isolation and appearance of nativity.

It may be not impossible that the group of trees described by Professor Harshberger is not identical with the one known to me. I do not, indeed, seem to recognize his wind swept trees near an ocean bluff. But the bluff, or low bank such as it is at Wauwinet, is at no great distance, and if there are really two groups of these pines their source of origin can scarcely have been other than the same. It does not seem to follow that any great phytogeographical import can attach to the fact that the Labrador pine grows on Nantucket, or that its presence there affords any just grounds for speculation on the mysteries of plant distribution.

NEW YORK CITY.

NEW RANGES FOR OLD PLANTS.

Oliver Atkins Farwell.

In the early autumn of 1915 I was invited by Mr. Gladewitz and Mr. Chandler, both of Detroit, to accompany them on a botanical excursion to Oakwood, a suburban village to the south of Detroit. This is the site of one of the many salt works in this locality. Here is located the Detroit Rock Salt Co. which has, in spite of many difficulties, sunk the only salt "shaft" in Michigan if not in the entire country. The water and fine crystals from the salt works have converted a large tract of land from that of a fresh soil to one of a saline character which has to a certain extent changed the character of the flora. Many species have disappeared that once were common. Some new ones have crept in that have a distinct preference for saline situations. These are *Salicornia Europaea* L. and its varieties *pachystachya* (Koch) Fernald and *prostrata* (Pall.) Fernald, *Aster subulatus* Mx., and *Pluchea camphorata* (L.) DC. Just how these seaboard plants found their way into Michigan is problematical. Scarcely by means of birds as the feathered tribes do not travel east and west but rather on a north and south line. We have no substantiated records showing that Atlantic or Pacific birds have migrated across country and into the Great Lake regions. We can only surmise that they may have been brought west by means of railway freight traffic and when lodgement was made in this section, which provided the proper saline conditions suitable for their development, they persisted and have made flourishing colonies that are rapidly extending over the entire section which has been made saline by means of the escaping water and salt crystals from the mine and the salt crushers. The Rayless Aster and the Salt Marsh Fleabane spread rather slowly but apparently have become firmly established.

The Glasswort has spread very rapidly and now covers acres of ground. The variety *prostrata* with its long, widely spreading, and decumbent lower branches seems very distinct from the normal form of the species with ascending, more uniform (as to length) branches. The variety *pachystachya* is frequent; but as found here it seems scarcely worthy of recognition. The only distinction is one of measurements and in the dried specimens, even this difference vanishes. There are

intermediate individuals also, bearing both thick and slender spikes. Mr. Gladewitz, Secretary and Treasurer of the Detroit Institute of Science, was the first to discover and report these squatters that have preëmpted that section of Michigan territory which seems to provide those cool and saline conditions to which they are accustomed in their native haunts.

Another traveler that recently has been reported from the eastern shores of Michigan between Detroit and Port Huron is *Aster angustus* (Lindl.) T. & G. This is quite plentiful on a common in the village of River Rouge, on the banks of the Detroit and Rouge Rivers. This village is not far removed from Oakwood and the salt fields probably underlie it though the surface soil, at least to a tyro, gives no indication of a saline character.

Mr. Chandler was the original discoverer of the Rayless Aster at this locality and probably the first to record it from Michigan.

Mr. Billington of Detroit, has discovered near Palmer Park, Detroit, Mich., a plant that proves to be *Pentstemon gracilis* Nutt. This is far east of its recorded range of from Minnesota to Missouri for its eastern limits. He has also found near Cass Lake *Galium erectum* Huds. This has not been recorded heretofore for localities west of the New England states. It seems to be well established at the locality mentioned. Specimens of the above have been preserved for their private herbaria by the original discoverers. Such as I have collected are as given below.

Salicornia Europaea L.: Oakwood, Mich.; *Farwell, Gladewitz & Chandler,* no. 4105, Sept. 23, 1915. *Salicornia Europaea* Linn. var. *pachystachya* (Koch) Fernald: Oakwood, Mich.; *Farwell, Gladewitz & Chandler,* no. 4107, Sept. 23, 1907. *Salicornia Europaea* Linn. var. *prostrata* (Pall.) Fernald: Oakwood, Mich.; *Farwell, Gladewitz & Chandler,* no. 4103. *Aster subulatus* Mx.: Oakwood, Mich.; *Farwell, Gladewitz & Chandler,* no. 4102, Sept. 23, 1915. *Aster angustus* (Lindl.) T. & G.: River Rouge, Mich.; *Farwell,* no. 4122, Sept. 30, 1915. *Pluchea camphorata* (Linn.) DC.: Oakwood, Mich.; *Farwell, Gladewitz & Chandler,* no. 4104, Sept. 23, 1915.

Department of Botany,
Parke, Davis & Co. Detroit, Michigan.

PRELIMINARY LISTS OF NEW ENGLAND PLANTS,—XXIV.

Clarence H. Knowlton.

[The sign + indicates that an herbarium specimen has been seen; the sign — that a reliable printed record has been found.]

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Saxifragaceae.						
Chrysosplenium americanum Schwein.	+	+	+	+	+	+
Deutzia scabra Thunb.						+
Heuchera americana L.						+
Hydrangea cinerea Small.				+		
" quercifolia Bartram						+
Mitella diphylla L.		+	+	+		+
" nuda L.	+	+	+	+		+
" prostrata Michx.						—
Parnassia caroliniana Michx.	+		+	+	+	+
Philadelphus coronarius L.			+	+	+	+
" " var. tomentosus (Wall.) Hook. f. & Thoms.				+		
Philadelphus inodorus L.						—
" pubescens Loisel.						—
Ribes americanum Mill.	+	+	+	+	+	+
" Cynosbati L.	+	+	+	+		+
" gracile Michx.						+
" Grossularia L.		+		+		+
" hirtellum Michx.	+	+	+	+	+	+
" " var. calcicola Fernald	+			+		
" lacustre (Pers.) Poir.	+	+	+	+		—
" nigrum L.	+	+	+	+		+
" odoratum Wendland	+			+	+	+
" prostratum L'Hér.	+	+	+	+		—
" rotundifolium Michx.						+
" triste Pall.	+	+	+			
" " var. albinervium (Michx.) Fernald	+	+	+	+		
" vulgare Lam.	+	+	+	+		+
Saxifraga aizoides L.			+			
" Aizoon Jacq.			+			
" oppositifolia L.			+			

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Saxifragaceae.						
Saxifraga pennsylvanica L.	+	+	+	+	+	+
" rivularis L.		+				
" stellaris L., var. comosa Willd.	+					
" virginiensis Michx.	+	+	+	+	+	+
Tiarella cordifolia L.	+	+	+	+		+
Hamamelidaceae.						
Hamamelis virginiana L.	+	+	+	+	+	+
Liquidambar Styraciflua L.				−		+
Platanaceae.						
Platanus occidentalis L.	−	+	+	+	+	+

Notes upon the above Lists.

For several of the Rhode Island records I have relied on reports by J. Franklin Collins, of specimens in his own herbarium and that of Brown University.

Astilbe japonica was collected on wastes in Providence by Mr. Collins in 1891 and 1892. The species maintained itself for several years.

Deutzia is often persistent in old gardens and nurseries, but I have found no record of *D. gracilis* Sieb. & Zucc. as spontaneous or spreading.

Hydrangea paniculata Sieb. often persists for years without cultivation, but does not spread. *H. cinerea* in the above list is escaped only at Groveland, Mass. *H. quercifolia* has been found at Norwalk, Conn., by Dr. E. H. Eames, in a large colony spread from former cultivation. As this species is not considered hardy in New England (Bailey, Cyclopedia of Horticulture), it will be interesting if this station persists.

Mitella diphylla is credited to Maine in the second Portland Catalogue, but I can find no specimens of it. Mr. Arthur H. Norton has written me from the Portland Society of Natural History: "I suspect that the inclusion in our Second Portland Catalogue may rest

upon its inclusion in the First Portland Catalogue, 1862 and 1864. *Mitella diphylla* may I think have arisen through an erroneous identification of *Tiarella cordifolia*. We have in our herbarium a specimen of the latter collected in 1877, labelled *Mitella diphylla!* from a point near Portland. In a hasty review of the subject I have found no Maine report earlier than the first Catalogue."

Mitella prostrata (See Fernald, RHODORA viii. 90–2, 1906). This plant was collected by Michaux at "lac Champlain," evidently at the Canadian end, "ad fines meridionales Canadae." A plant corresponding to Michaux's specimen was found at New Milford, Conn., by C. K. Averill and E. H. Austin (Conn. Geol. and Nat. Hist. Survey, Bull. No. 14, 216, 1910). Botanists who collect where *M. diphylla* is abundant should watch for this plant, which seems closely related to that species.

The various kinds of *Philadelphus* are often persistent around old places, but *P. coronarius* seems to be the only species vigorous enough to spread much.

Ribes gracile is apparently a waif in our territory (Conn. Geol. and Nat. Hist. Survey, Bull. No. 14, 217–8, 1910). *R. hirtellum*, var. *calcicola* is reported only from Monhegan and Martha's Vineyard, but should be looked for elsewhere, especially along the coast. There are various indefinite printed reports of *R. rotundifolium* from western Massachusetts, but I have not succeeded in finding any authentic specimens.

Parnassia caroliniana, abundant in Aroostook County, Me., seems to skip central and western Maine and New Hampshire entirely, to reappear in the calcareous districts of western and southern New England.

The three calciphile species of *Saxifraga*, *S. aizoides*, *S. Aizoon* and *S. oppositifolia*, are found only in the Willoughby region and Smuggler's Notch, Vermont. *S. rivularis* is found only on Mt. Washington, and *S. stellaris*, var. *comosa* only on Mt. Ktaadn.

Liquidambar Styraciflua is reported from Northampton, Mass., in Tuckerman & Frost's Catalogue of Plants growing without cultivation within thirty miles of Amherst College, 1875. No station is known for it now, but the tree is so unlike others that it is hard to see how botanists like Amos Eaton and Edward Tuckerman could be mistaken in the matter. I should suggest that it be searched for in the strip of land between Mt. Tom and the Connecticut River, south of Smith's Ferry, which has recently been annexed to the city of Holyoke.

I have found no specimen of *Platanus occidentalis* from Maine. I include the record, however, because it is reported by George B. Emerson, who says, "Along the coast I have found it in the county of York, in Maine." (Trees and Shrubs of Mass., 3d ed. vol. 1, 266, 1878.)

Hingham, Massachusetts.

REPORTS ON THE FLORA OF THE BOSTON DISTRICT, — XXV.

CAPPARIDACEAE.

CLEOME.

C. serrulata Pursh. Field off Water St., Lawrence (*M. E. Gutterson*, Aug. 4, 1903). Introduced from the West.

C. spinosa L. Dump east of University Press, Cambridge (*A. S. Pease*, Sept. 30, 1907); Lexington, according to Mabel P. Cook, Rhodora i. 81, 1899.

RESEDACEAE.

RESEDA.

R. alba L. Garden escape; Lynn, Dedham, Blue Hills, Sherborn.

R. lutea L. Fields and roadsides; Rockport, Tyngsboro, Westford, Lexington, Charlestown, Sherborn.

R. Luteola L. Lynn (*Wm. Boott*, June 16, 1855; specimen in Gray Herb.).

R. odorata L. Boston (*C. E. Perkins*, Aug. 5, 1882); casual escape, cultivated ground, Dorchester (*J. R. Churchill*, —, 1882). From northern Africa and Syria.

SARRACENIACEAE.

SARRACENIA.

S. purpurea L. Peat-bogs and wet meadows, common.

S. purpurea L., var. **heterophylla** (Eat.) Torr. Form correspond-

ing to this is reported in Robinson, Fl. Essex Co. 32, 1880. The same form has been found at Scituate by Edward Wesley Cushman.

DROSERACEAE.

DROSERA.

D. longifolia L. Wet shores and bogs, frequent throughout. A caulescent form is described and illustrated in RHODORA ii. 70, 1900.

D. rotundifolia L. Moist soil and wet sandy shores, common.

PODOSTEMACEAE.

PODOSTEMUM.

P. ceratophyllum Michx. On rocks in running water; Charles River, S. Natick (*E. & C. E. Faxon*, Aug. 3, 1880 et seq.); Stony Brook [Weston ?], (*J. W. Blankinship*, Oct. 18, 1894).

CRASSULACEAE.

PENTHORUM.

P. sedoides L. Swampy places, common.

SEDUM.

S. ACRE L. Dry ledges, frequent.

S. TRIPHYLLUM (Haw.) S. F. Gray. (*S. purpureum* Tausch. See RHODORA xi. 46, 1909). Roadsides and yards, frequent.

S. REFLEXUM L. Pigeon Cove, Rockport (*Mrs. Wheeler*, 1876 et als.). Concerning this species as an escape from cultivation, Prof. Asa Gray wrote in the American Naturalist for October, 1876, on page 553, as follows: "This Old World *Sedum*, which is occasionally met with in old-fashioned gardens, has established itself at Pigeon Cove, Essex County, Mass. . . . . It occupies an old stone-heap, in a patch a yard or two in diameter, where 'Mrs. Sarah Ann Colburn says she noticed it when she was a very little girl, at least sixty years ago.' . . . . As the station of the plant is only a few rods distant from the ancient

dwelling known as 'the Garrison House' .... we cannot doubt that it is an escape from gardens." Also in some abundance by a roadside in dry woods between Carlisle and Concord (*M. L. Fernald & S. C. Brooks*, October 6, 1912).

S. TERNATUM Michx. Garden escape, Danvers (*J. Robinson*, —, 1877; *J. Robinson & C. E. Faxon*, May 29, 1885).

SEMPERVIVUM.

S. TECTORUM L. Ledges and hillsides; Woburn, Winchester, Medford, Sudbury, Natick, Norfolk.

TILLAEA.

T. aquatica L. Mud flats of Merrimac River at the "Laurels," tidal banks above salt water, Newburyport (*A. A. Eaton*, September, 1895; specimen in Gray Herb.).

SAXIFRAGACEAE.

CHRYSOSPLENIUM.

C. americanum Schwein. Brooks and ditches, common throughout.

HYDRANGEA.

H. CINEREA Small. Escaped, Groveland (*A. R. Lunt*, Aug. 28, 1911).

MITELLA.

M. diphylla L. Rich woods; Salisbury (*Edward Moulton*, —, 1886); Newburyport (*Edward Moulton*, May 20, 1887); Purgatory Swamp, Norwood (*C. W. Swan*, June 17, 1882); Groton (*Miss H. E. Haynes*), according to Dame & Collins, Fl. Middlesex Co. 35, 1888.

M. nuda L. Indian Hill Run, West Newbury (*A. A. Eaton*, ——, 1897; specimen in herb. N. E. Botanical Club).

PARNASSIA.

P. caroliniana Michx. Meadows; Danvers, Lynnfield, Wakefield, Malden, Weston, Groton, Framingham; Georgetown, Topsfield, Hamilton, Marblehead, according to Robinson, Fl. Essex Co. 51, 1880; Reading, Ashland, according to Dame & Collins, Fl. Middlesex Co. 35, 1888.

PHILADELPHUS.

P. CORONARIUS L. Roadside escape, Blue Hills (*W. H. Manning*, Sept. 1, 1895).

P. CORONARIUS L., var. TOMENTOSUS (Wall.) Hook. f. & Thoms. A foreign introduction; well established, persistent and forming thickets on rocky knoll near site of old greenhouse, Arlington (*C. A. Weatherby*, Aug. 4 and 24, 1908). See RHODORA xvii. 122, 1915.

RIBES.

R. americanum Mill. (*R. floridum* L'Hér.; see RHODORA xi. 46, 1909.) Moist soil from Sherborn and the Blue Hills north, occasional; also at N. Easton (*C. Blomberg*, May 6, 1902).

R. GROSSULARIA L. Wilmington (*B. L. Robinson*, May 4, 1899); roadside, Arlington, (*M. L. Fernald*, May 11, 1913); Blue Hills (*W. H. Manning*, Aug. 21, 1894); in woods, dry rocky hillside, Cohasset (*J. A. Cushman*, May 29, 1907).

R. hirtellum Michx. (*R. oxyacanthoides* of authors, not L.; see Fernald, RHODORA xiii. 73–76, 1911.) In wet and dry soil, frequent throughout.

R. NIGRUM L. Occasional garden escape; "Ipswich River," Lowell, Milton, Medway.

R. ODORATUM Wendland. (*R. aureum* of authors, not Pursh.; see RHODORA xi. 47, 1909.) Persistent and escaping from old gardens; Georgetown, Andover, Salem, Sherborn.

R. VULGARE Lam. Spontaneous, persistent, frequent throughout.

SAXIFRAGA.

S. pennsylvanica L. Swamps and meadows, common throughout.

S. virginiensis Michx. Dry banks and ledges, very common throughout.

TIARELLA.

T. cordifolia L. Rich woods, rare; Salisbury, Amesbury, Newburyport, Danvers, Norwood; Groton (C. W. Jenks) according to Dame & Collins, Fl. Middlesex Co. 35, 1888; "'Rare in Lynn, Dr. Holder legit' (Tracy)", according to Robinson, Fl. Essex Co. 52, 1880.

HAMAMELIDACEAE.

HAMAMELIS.

H. virginiana L. Swamps and moist open woods; frequent throughout.

PLATANACEAE.

PLATANUS.

P. occidentalis L. Moist soil, especially by streams; occasional throughout, native in some places, transplanted to others.

C. H. KNOWLTON, WALTER DEANE } *Committee on Local Flora.*

ANOMALOUS FLOWERS OF POGONIA VERTICILLATA.

FRANK WALTERS.

ON June 1st, 1916, I went to Mt. Washington, Berkshire County, Massachusetts, and visited a colony of *Pogonia verticillata* which I located there the preceding summer. I wanted to see if any of the plants were in flower, as I could find no evidence last year that any had flowered that season. A fair proportion of the plants were in flower. I found one plant 2-flowered, with flowers on separate peduncles, and a remarkable series of six plants each with two flowers on one thickened peduncle. As the plants vary somewhat I will describe them.

Plant No. 1. One flower perfect; the other flower with lip and column, and one petal (lacks one) opposite the lip. Has but two sepals, the one usually over the column being absent. One sepal is twice the usual width.

Plants Nos. 2, 3 and 4. One flower perfect. The other has column, but no lip, and has two petals placed opposite each other and appearing to enclose the column, although they are free their full length. Sepals 2, at sides (not over) the petals; the lip replaced by a petal.

Plant No. 5. Peduncle (3.2 cm. long) divided about 6 mm. from base of flowers; otherwise similar to Nos. 2, 3 and 4.

Plant No. 6. Peduncle (3.7 cm. long) divided about 2 mm. from base of flowers; and one sepal of the imperfect flower is very wide; otherwise similar to Nos. 2, 3 and 4.

The six plants were not growing in one little group but were scattered about. It is probable, however, that a 25-foot circle would have enclosed them. It is strange that each plant has but five sepals; in each case the sepal usually over the column is absent from the imperfect flower. As the flowers are placed lip to lip and grow close together it is that sepal which has the best chance to develop, not being in contact with the other flower. The parts of all the columns are perfect in every way. The plants each have five leaves, are of average height, and the sepals are of average length.

The following day I visited a colony of *Pogonia verticillata* in Great Barrington and examined over seventy flowering plants, but aside from one 2-flowered plant they presented no unusual features.

Great Barrington, Massachusetts.

ERRATA.

Page 50, line 34; *for* Fairbanks *read* Fairfield.
" 62, " 32; for *carolinianum* read *caroliniana*.
" 64, " 29; for *californicum* read *californica*.
" 65, " 19; for *californicum* read *californica*.
" 120, " 32; for CONRAD read CONARD.
" 146, " 6; for *Sabbatia* read *Sabatia*.
" 157, " 27; for *cephalotes* read *Cephalotes*.
" 158, " 22; for *eximium* read *eximia*.
" 158, " 26; for LIMONIUM IMBRICATUM read **Limonium imbricatum**.
" 159, " 13; for **alba** read *alba*.
" 159, " 18; for *angustifolium* read *angustifolia*.
" 221, " 5; *after* (L.) *insert* Bess.
" 234, " 14; for PENNYSLVANICA read PENNSYLVANICA.

On the first page of the cover for the May number *for* Conrad *read* Conard.

Vol. 18, no. 215, including pages 225 to 240, was issued 1 November, 1916.

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